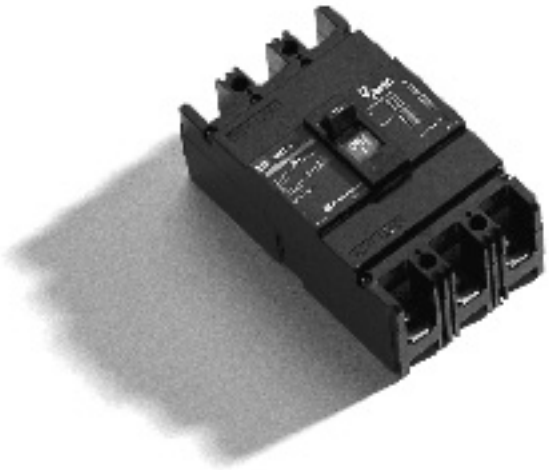
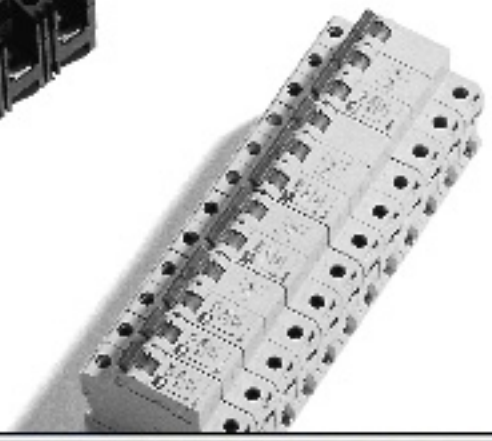
LG MCCB [Guide Book]

Low voltage circuit breakers

Moulded Case Circuit Breaker
Miniature Circuit Breaker
Earth Leakage Circuit Breaker





- Description
- Molded case circuit breaker
  - Specification
  - Accessories
  - Technical data
- Earth leakage circuit breaker
  - Specification
  - Accessories
- Circuit breaker for household and similar installations
  - Miniature circuit breaker
  - Earth leakage circuit breaker

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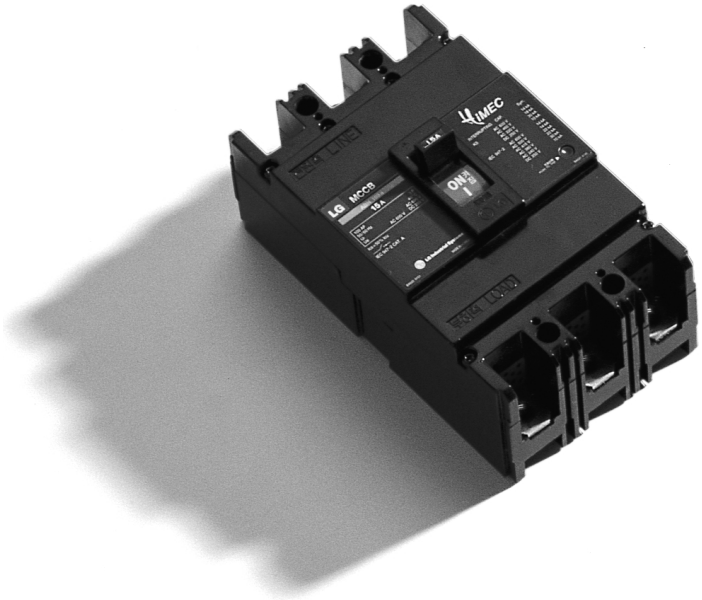
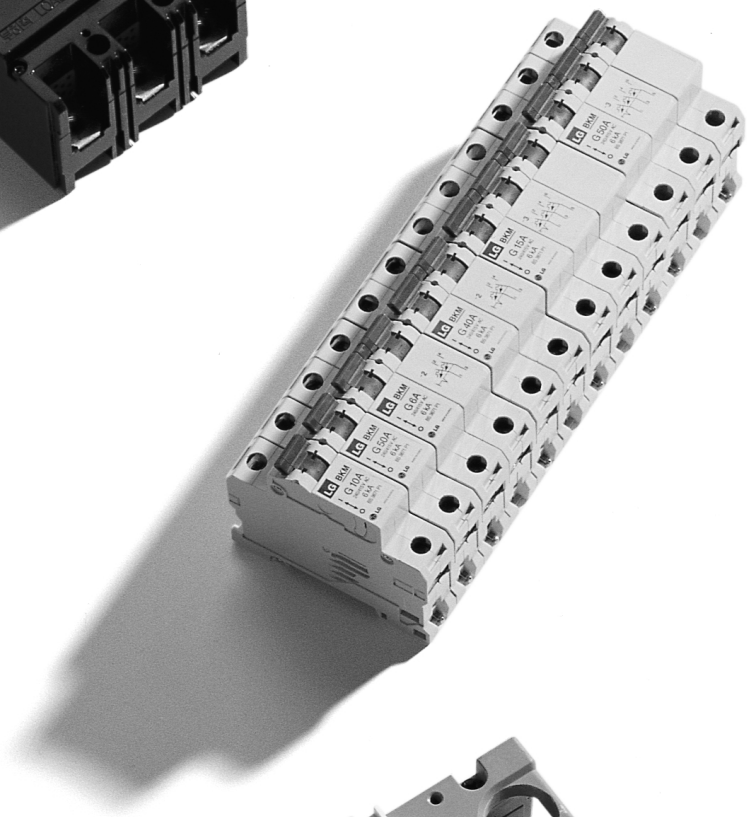
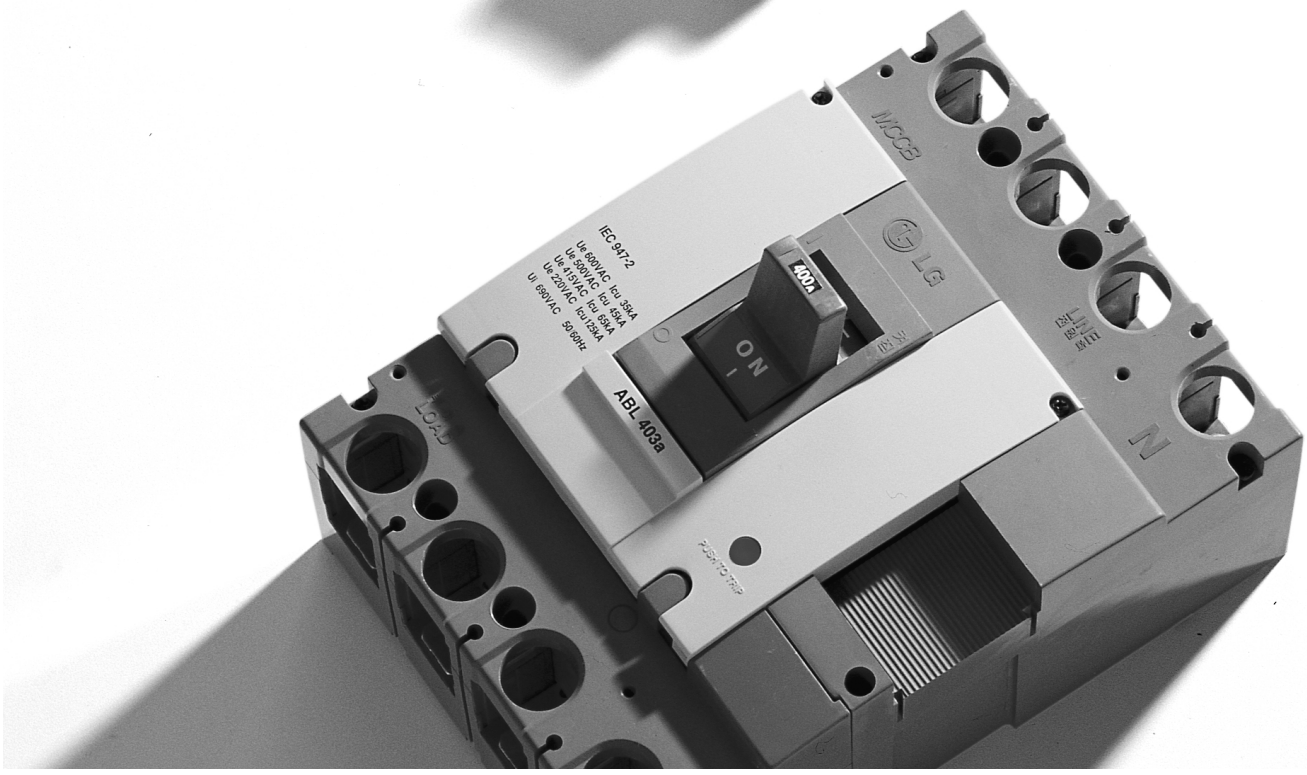
LG Industrial Systems

Low voltage circuit breakers

Moulded Case Circuit Breaker
Miniature Circuit Breaker
Earth Leakage Circuit Breaker







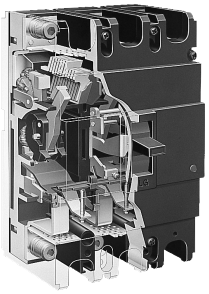
Description

for MCCBs up to 225A

Modular Dimension
Front cover cutout:24 ×52mm
Depth:64mm(up to 100AF, 10kA at415Vac

Trip-free mechanism

Compact & economic type
ABE, ABS series : up to
15kA at 415Vac



Higher breaking type
ABH, ABL series : up to
65kA at 415 Cac

Tripping Devices
Thermal-magnetic
Hydraulic-magnetic

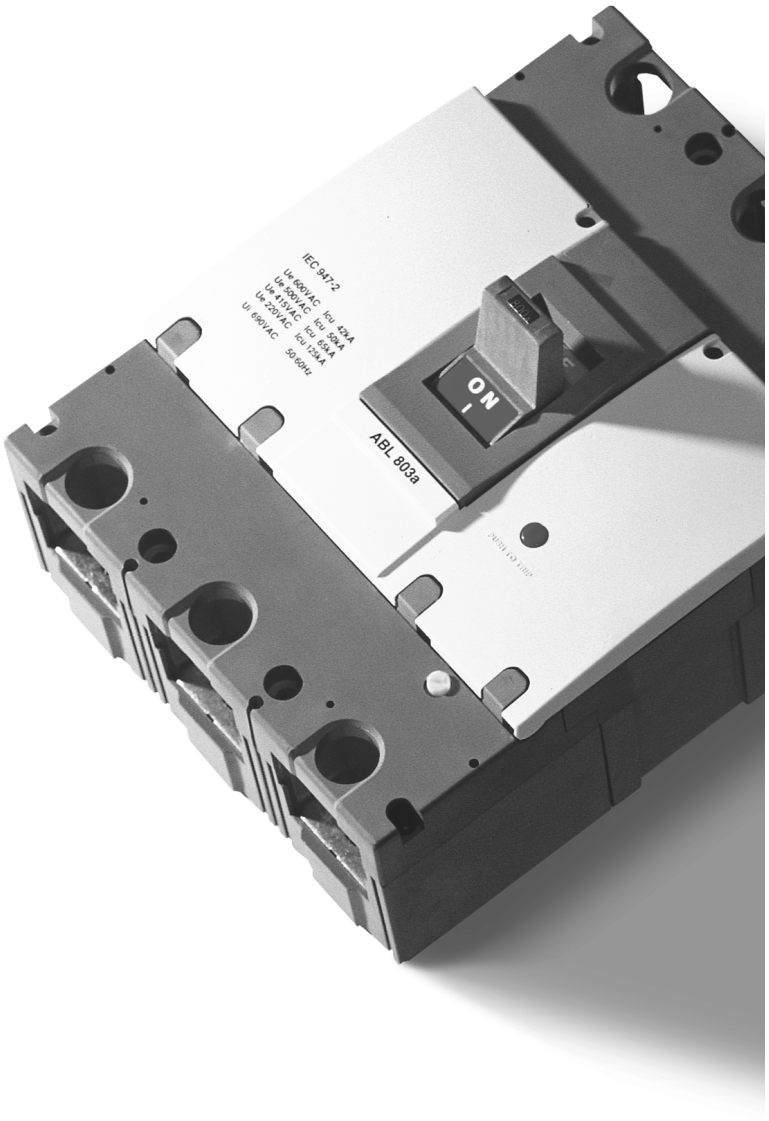
Full range of 4 pole MCCB
built with early make late break
neutral contact

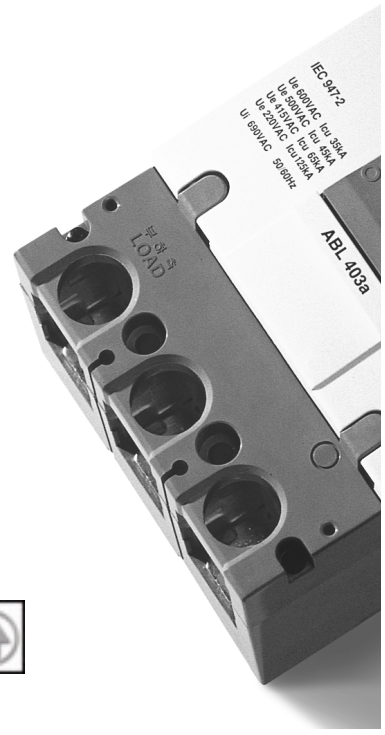
International Standard
Conforming to IEC947-2
CE marking

ISO9001 quality assuarance

CERTIFICATE
of Conformity
TÜV Rheinland
CERTIFICATE
The TÜV CERT Certification Body
of TÜV Rheinland
Sicherheit und Umweltschutz GmbH
hereby certifies in accordance with TÜV CERT
procedures that
LG INDUSTRIAL SYSTEMS CO., LTD.
ELECTRIC EQUIPMENT BUSINESS UNIT
LG TWIN TOWERS, 20 YOIDO-DONG, YOUNGDUNGPO-GU
SEOUL, KOREA AND CHEONGJU PLANT
has established and applies a quality system for
DESIGN/DEVELOPMENT, PRODUCTION, INSTALLATION AND
SERVICING FOR ELECTRIC LOW VOLTAGE SWITCHES AND
CIRCUIT BREAKERS AND ELECTRICITY METERS
An audit was performed,
Report No. 4815
Proof has been furnished that the requirements according to
DIN EN ISO 9001 : 1994
are fulfilled.
The certificate is valid until
Certificate Registration No.
TÜV Rheinland

• CE and ISO 9001 certificates





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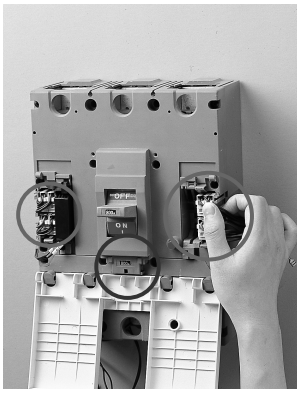


- **Hinged front cover flap**
  makes it easier to mount internal accessories ;Alarm Switch, Auxiliary Switch, Shunt trip and UVT
- **Rating plug**
  Thermal currents are field iinter-changeable by replacing it between:
  250-300A
  350-400A
  500-600A
  700-800A

Description

for MCCBs up to 250A to 1200A

Easy to mount optional accessories
Hinged front cover flag makes it easier to mount internal
accessories like Auxiliary contact, Alarm contact shunt trip unit and Under voltage trip unit

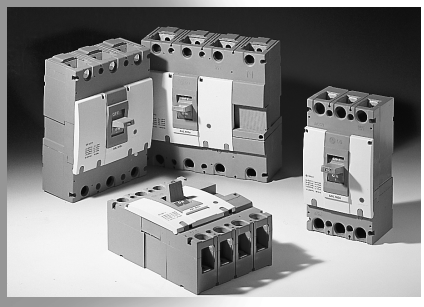
Trip-Free mechanism

Conpact design with High breaking capacity
35, 50, 65 and 85kA

Tripping Devices
Fixed thermal/Interchangeable thermal
Fixed or adjustable magnetic

Dual-current rating
Thermal currents are field interchangeable
by replacing rating plug between
250A and 300A, 350A and 400A,
500A and 600A, 700A and 800A

International Standard
Conforming to IEC947-2
CE marking in preparation (up to 800A)



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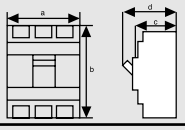
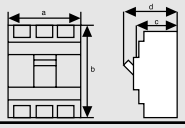
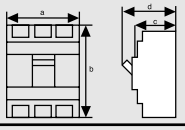
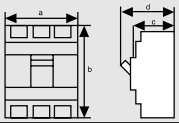
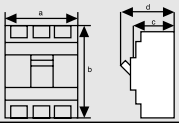
Series Outline

			30A			50A			60A			100A		
E-Series	Type		ABE 3□			ABE 5□a			ABE 6□a			ABE 10□a		
	Number of poles		2	3		2	3		2	3		2	3	
	Rated Insulation Voltage (V)	AC 50/60Hz	490			690			690			690		
	Breaking capacity	AC 500V	-			2.5			2.5			7.5		
	(kA ms)	AC 380/415V	1.5			5			5			14/10		
	IEC947-2	AC 220/240V	2.5			10			10			25		
	Dimension 	a	50	75		50	75		50	75		50	75	
		b	96			130			130			130		
		c	60			64			64			64		
		d	80			80			80			80		
S-Series	Type		ABS 3□a			ABS 5□a			ABS 6□a			ABS 10□a		
	Number of poles		2	3		2	3	4	2	3	4	2	3	4
	Rated Insulation Voltage (V)	AC 50/60Hz	690			690			690			690		
	Breaking capacity	AC 500V	2.5			7.5			7.5			7.5		
	(kA ms)	AC 380/415V	5			14/10			14/10			14		
	IEC947-2	AC 220/240V	10			25			25			25		
	Dimension 	a	50	75	100	50	75	100	50	75	100	60	90	120
		b	130			130			130			130		
		c	64			64			64			64		
		d	80			80			80			82		
H-Series	Type		ABH 3□a			ABH 5□a						ABH 10□a		
	Number of poles		2	3		2	3	4				2	3	4
	Rated Insulation Voltage (V)	AC 50/60Hz	690			690						690		
	Breaking capacity	AC 500V	7.5			7.5						14		
	(kA ms)	AC 380/415V	14/10			14						22		
	IEC947-2	AC 220/240V	25			25						30		
	Dimension 	a	50	75	100	60	90	120				60	90	120
		b	130			155						155		
		c	64			64						64		
		d	80			82						82		
L-Series	Type					ABL 5□a						ABL 10□a		
	Number of poles					2	3	4				2	3	4
	Rated Insulation Voltage (V)	AC 50/60Hz				690						690		
	Breaking capacity	AC 500V				42						42		
	(kA ms)	AC 380/415V				65						65		
	IEC947-2	AC 220/240V				100						100		
	Dimension 	a				74	105	140				74	105	140
		b				165						165		
		c				86						86		
		d				109						109		
Electronic MCCB	Type													
	Number of poles													
	Rated Insulation Voltage (V)	AC 50/60Hz												
	Breaking capacity	AC 500V												
	(kA ms)	AC 380/415V												
	IEC947-2	AC 220/240V												
	Dimension 	a												
		b												
		c												
		d												

The above described "□" indicates the number of poles in each types. (2,3,4 poles)

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225A	400A	600A	800A	1000A	1200A
ABE 20□a	**ABE 40□a**		**ABE 80□a**		
2 3	2 3		2 3		
690	690		690		
7.5	18		25		
10	25		35		
18	35		50		
105 105	140 140		210 210		
165	257		275		
64	109		109		
84	145		145		
ABS 20□a	**ABS 40□a**		**ABS 80□a**	**ABS 100□**	**ABS 120□**
2 3 4	2 3 4		2 3 4	3 4	3 4
690	690		690	690	690
7.5	25		45	50	50
14	35		50	65	65
25	50		100	100	100
105 105 140	140 140 185		210 210 280	210 280	210 280
165	157		275	400	400
64	109		109	105	105
84	145		145	158	158
ABH 20□a	**ABH 40□a**				
2 3 4	2 3 4				
690	690				
35	35				
45	50				
85	85				
105 105 140	140 140 185				
165	257				
103	109				
127	145				
ABL 20□a	**ABL 40□a**		**ABL 80□a**	**ABL 100□**	**ABL 120□**
2 3 4	2 3 4		2 3 4	3 4	3 4
690	690		690	690	690
42	50		50	75	75
65	65		65	85	85
125	125		125	125	125
105 105 140	140 140 185		210 210 280	210 280	210 280
165	257		275	406	406
103	109		109	140	140
127	145		145	190	190
			ABS 803E	**ABS 1003E**	
			3	3	
			690	690	
			65	65	
			65	65	
			100	100	
			210	210	
			400	400	
			105	105	
			158	158	

Specification

30A

Type			E-Type		S-Type		H-Type	
			ABE32	ABE33	ABS32a	ABS33a	ABH32a	ABH33a
Rated insulation voltage (V)		Ui	490		690		690	
Rated impulse voltage (kV)		Uimp	6		6		6	
Rated maximum operating voltage (V)		Ue	460		600		600	
Number of poles			2	3	2	3	2	3
Rated current at 40 ℃ (A)	In		3		5		5	
			5		10		10	
			10		15		15	
			15		20		20	
			20		30		30	
			30					
Rated ultimate	AC voltage	690V	-		-		-	
breaking capacity		600V	-		2.5		5	
Icu		500V	-		2.5		7.5	
according to		415V	1.5		5		10	
IEC947-2		380V	1.5		5		14	
		240V	2.5		10		25	
	DC voltage	250V	-		2.5		5	
Rated service-circuit breaking capacity		Ics(=%Icu)	50		50		50	
Rated peak short-circuit	AC voltage	415V	-		7.5		17	
breaking capacity (kA)	Icm	240V	-		17		53	
Current setting			Fixed		Fixed		Fixed	
Tripping device	Thermal magnetic							
	Hydraulic magnetic		○		○		○	
	Magnetic-only							
Trip test button			○		○		○	
Dimension (mm)		a	50	75	50	75	50	75
		b	96		130		130	
		c_1	60		60		60	
		c_2	-		64		64	
		d	80		80		80	
	Weight (kg)		0.3	0.5	0.45	0.65	0.6	0.8
Connection (front)			Terminal screw & rail [1]		Terminal screw			
Accessories	Auxiliary swich	AL	-		○		○	
	Alam switch	AX	-		○		○	
	Shunt trip	SHT	-		○		○	
	Undervoltage trip	UVT	-		○		○	
	Rotary handle N-Type		-		N-30			
	Terminal cover		-		○		○	
	Insulation barrier		-		Basic		Basic	

[1] 35mm IEC rail mounting is available on request.

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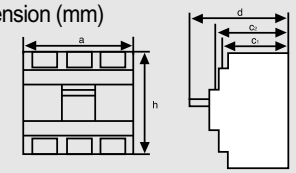
Specification

50A

Type			E-Type			S-Type			H-Type			L-Type		
			ABE52a	ABE53a		ABS52a	ABS53a	ABS54a	ABH52a	ABH53a	ABH54a	ABL52a	ABL53a	ABL54a
Rated insulation voltage (V)		Ui	690			690			690			690		
Rated impulse voltage (kV)		Uimp	6			6			6			6		
Rated maximum operating voltage (V)		Ue	600			600			600			600		
Number of poles			2	3		2	3	4	2	3	4	2	3	4
Rated current at 40℃ (A)		In	5			5			15			15		
			10			10			20			20		
			15			15			30			30		
			20			20			40			40		
			30			30			50			50		
			40			40								
			50			50								
Rated ultimate	AC voltage	690V	-			-			-			-		
breaking capacity		600V	2.5			5			7.5			35		
Icu		500V	2.5			7.5			7.5			42		
according to		415V	5			10			14			65		
IEC947-2		380V	5			14			14			65		
		240V	10			25			25			100		
	DC voltage	250V	2.5			5		-	10		-	40		-
Rated service-circuit breaking capacity		Ics(=%Icu)	50			50			50			50		
Rated peak short-circuit	AC voltage	415V	7.5			17			28			143		
breaking capacity (kA)	Icm	240V	17			53			53			220		
Current setting			Fixed			Fixed			Fixed			Fixed		
Tripping device	Thermal magnetic								○			○		
	Hydraulic magnetic		○			○								
	Magnetic-only													
Trip test button			○			○			○			○		
Dimension (mm)		a	50	75		50	75	100	60	90	120	74	105	140
		b	130			130			155			165		
		c_1	60			60			60			82		
		c_2	64			64			64			86		
		d	80			80			82			109		
	Weight (kg)		0.45	0.65		0.6	0.8	1.0	0.7	1.1	1.5	1.0	1.7	2.3
Connection (front)			Terminal screw											
Accessories	Auxiliary switch	AL	○			○			○			○		
	Alarm switch	AX	○			○			○			○		
	Shunt trip	SHT	○			○			○			○		
	Undervoltage trip	UVT	○			○			○			○		
	Rotary handle	N-Type	N-30						N-40			N-55		
	Terminal cover		○			○			○			-		
	Insulation barrier		Basic			Basic			Basic			Basic		

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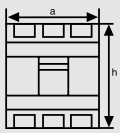
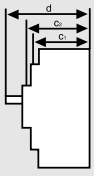
Specification

60A

Type			E-Type			S-Type		
			ABE62a	ABE63a		ABS62a	ABS63a	ABS64a
Rated insulation voltage (V)		Ui	690			690		
Rated impulse voltage (kV)		Uimp	6			6		
Rated maximum operating voltage (V)		Ue	600			600		
Number of poles			2	3		2	3	4
Rated current at 40℃ (A)		In	60			60		
Rated ultimate breaking capacity Icu according to IEC947-2	AC voltage	690V	-			-		
		600V	2.5			5		
		500V	2.5			7.5		
		415V	5			10		
		380V	5			14		
		240V	10			25		
	DC voltage	250V	2.5			5		-
Rated service-circuit breaking capacity		Ics(=%Icu)	50			50		
Rated peak short-circuit breaking capacity (kA)	AC voltage	415V	7.5			7.5		
	Icm	240V	17			17		
Current setting			Fixed			Fixed		
Tripping device	Thermal magnetic							
	Hydraulic magnetic		○			○		
	Magnetic-only							
Trip test button				○			○	
Dimension (mm)  		a	50	75		50	75	100
		b		130			130	
		c_1		60			60	
		c_2		64			64	
		d		80			80	
	Weight (kg)		0.45	0.65		0.6	0.8	1.0
Connection (front)			Terminal screw					
Accessories	Auxiliary switch	AL		○			○	
	Alarm switch	AX		○			○	
	Shunt trip	SHT		○			○	
	Undervoltage trip	UVT		○			○	
	Rotary handle	N-Type					N-30	
	Terminal cover			○			○	
	Insulation barrier			Basic			Basic	

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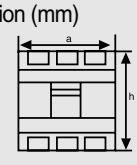
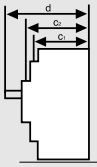
Specification

100A

Type			E-Type			S-Type			H-Type			L-Type		
			ABE102a	ABE103a		ABS102a	ABS103a	ABS104a	ABH102a	ABH103a	ABH104a	ABL102a	ABL103a	ABL104a
Rated insulation voltage (V)		Ui	690			690			690			690		
Rated impulse voltage (kV)		Uimp	6			6			6			6		
Rated maximum operating voltage (V)		Ue	600			600			600			600		
Number of poles			2	3		2	3	4	2	3	4	2	3	4
Rated current at 40℃ (A)		In	5			15			15			15		
			10			20			20			20		
			15			30			30			30		
			20			40			40			40		
			30			50			50			50		
			40			60			60			60		
			50			75			75			75		
			60			100			100			100		
			75											
			100											
Rated ultimate	AC voltage	690V	-			-			-			-		
breaking capacity		600V	5			7.5			10			35		
Icu		500V	7.5			7.5			14			42		
according to		415V	10			14			22			65		
IEC947-2		380V	14			14			22			65		
		240V	25			25			30			100		
	DC voltage	250V	5			10		-	10		-	40		-
Rated service-circuit breaking capacity		Ics(=%Icu)	50			50			50			50		
Rated peak short-circuit	AC voltage	415V	17			28			46			143		
breaking capacity (kA)	Icm	240V	53			53			63			220		
Current setting			Fixed			Fixed			Fixed			Fixed		
Tripping device	Thermal magnetic					○			○			○		
	Hydraulic magnetic		○											
	Magnetic-only											○		
Trip test button			○			○			○			○		
Dimension (mm)		a	50	75		60	90	120	60	90	120	74	105	140
		b	130			155			155			165		
		c_1	60			60			60			82		
		c_2	64			64			64			86		
		d	80			82			82			109		
	Weight (kg)		0.6	0.8		0.7	1.1	1.5	0.7	1.1	1.5	1.0	1.7	2.3
Connection (front)			Terminal screw											
Accessories	Auxiliary switch	AL	○			○			○			○		
	Alarm switch	AX	○			○			○			○		
	Shunt trip	SHT	○			○			○			○		
	Undervoltage trip	UVT	○			○			○			○		
	Rotary handle	N-Type	N-30			N-40						N-55		
	Terminal cover		○			○			○			-		
	Insulation barrier		Basic			Basic			Basic			Basic		

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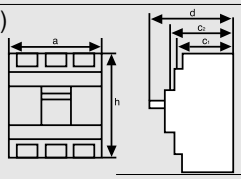
Specification

225A

Type			E-Type			S-Type			H-Type			L-Type		
			ABE202a	ABE203a		ABS202a	ABS203a	ABS204a	ABH202a	ABH203a	ABH204a	ABL202a	ABL203a	ABL204a
Rated insulation voltage (V)		Ui	690			690			690			690		
Rated impulse voltage (kV)		Uimp	6			6			6			6		
Rated maximum operating voltage (V)		Ue	600			600			600			600		
Number of poles			2	3		2	3	4	2	3	4	2	3	4
Rated current at 40 ℃ (A)		In	125 150 175 200 225			125 150 175 200 225			125 150 175 200 225			125 150 175 200 225		
Rated ultimate ultimate breaking capacity Icu according to IEC947-2	AC voltage	690V	-			-			-			-		
		600V	7.5			7.5			25			35		
		500V	7.5			7.5			35			42		
		415V	10			14			45			65		
		380V	10			14			45			65		
		240V	18			25			85			125		
	DC voltage	250V	10			10		-	40		-	40		-
Rated service-circuit breaking capacity		Ics(=%Icu)			50			50			50			50
Rated peak short-circuit breaking capacity (kA) Icm	AC voltage	415V	17			28			95			143		
		240V	36			53			187			275		
Current setting			Fixed			Fixed			Fixed			Fixe		
Tripping device	Thermal magnetic		○			○			○			○		
	Hydraulic magnetic													
	Magnetic-only											○		
Trip test button			○			○			○			○		
Dimension (mm) 		a	105	105		105	105	140	105	105	140	105	105	140
		b	165			165			165			165		
		c_1	60			60			99			99		
		c_2	64			64			103			103		
		d	84			84			127			127		
	Weight (kg)		1.1	1.3		1.1	1.3	1.5	2.1	2.3	2.5	2.1	2.3	2.5
Connection (front)			Terminal screw											
Accessories	Auxiliary switch	AL	○			○			○			○		
	Alarm switch	AX	○			○			○			○		
	Shunt trip	SHT	○			○			○			○		
	Undervoltage trip	UVT	○			○			○			○		
	Rotary handle	N-Type	N-50						N-60					
	Terminal cover		○			○			○			-		
	Insulation barrier		Basic			Basic			Basic			Basic		

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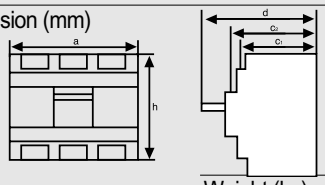
Specification

400A

Type			E-Type			S-Type			H-Type			L-Type		
			ABE402a	ABE403a		ABS402a	ABS403a	ABS404a	ABH402a	ABH403a	ABH404a	ABL402a	ABL403a	ABL404a
Rated insulation voltage (V)		Ui	690	690	690	690								
Rated impulse voltage (kV)		Uimp	6	6	6	6								
Rated maximum operating voltage (V)		Ue	600	600	600	600								
Number of poles			2	3		2	3	4	2	3	4	2	3	4
Rated current at 40℃ (A)		In	250(300)[1] 300(250) 350(400) 400(350)			250(300) 300(250) 350(400) 400(350)			250(300) 300(250) 350(400) 400(350)			250(300) 300(250) 350(400) 400(350)		
Rated ultimate breaking capacity Icu according to IEC947-2	AC voltage	690V	-			-			-			-		
		600V	18			22			30			35		
		500V	18			25			35			45		
		415V	25			35			50			65		
		380V	25			42			65			85		
		240V	35			50			85			125		
	DC voltage	250V	10		-	20		-	40		-	40		-
Rated service-circuit breaking capacity		Ics(=%Icu)	50			50			50			50		
Rated peak short-circuit breaking capacity (kA)	AC voltage	415V	52.5			73.5			110			143		
	Icm	240V	73.5			110			187			275		
Current setting			Fixed			Fixed			Fixed			Fixed		
Tripping device	Thermal magnetic		○			○			○			○		
	Hydraulic magnetic													
	Magnetic-only											○		
Trip test button			○			○			○			○		
Dimension (mm) 		a	140	140		140	140	185	140	140	185	140	140	185
		b	257			257			257			257		
		c_1	109			109			109			109		
		c_2	113			113			113			113		
		d	145			145			145			145		
	Weight (kg)		5.2	6.2		5.2	6.2	7.8	5.2	6.2	7.8	5.2	6.2	7.8
Connection (front)			Terminal screw											
Accessories	Auxiliary switch	AL	○			○			○			○		
	Alarm switch	AX	○			○			○			○		
	Shunt trip	SHT	○			○			○			○		
	Undervoltage trip	UVT	○			○			○			○		
	Rotary handle	N-Type	N-70											
	Terminal cover		○			○			○			○		
	Insulation barrier		Basic			Basic			Basic			Basic		

[1] Ratings are interchangeable with the values by the replacing rating plug.

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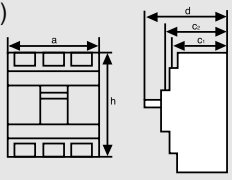
Specification

800A

Type			E-Type			S-Type			L-Type		
			ABE802a	ABE803a		ABS802a	ABS803a	ABS804a	ABL802a	ABL803a	ABL804a
Rated insulation voltage (V)		Ui	690			690			690		
Rated impulse voltage (kV)		Uimp	6			6			6		
Rated maximum operating voltage (V)		Ue	600			600			600		
Number of poles			2	3		2	3	4	2	3	4
Rated current at 40 ℃ (A)		In	500(600)[1] 600(500) 700(800) 800(700)			500(600) 600(500) 700(800) 800(700)			500(600) 600(500) 700(800) 800(700)		
Rated ultimate breaking capacity Icu according to IEC947-2	AC voltage	690V	-			-			-		
		600V	22			35			42		
		500V	25			45			50		
		415V	35			50			65		
		380V	42			65			85		
		240V	50			100			125		
	DC voltage	250V	20	-		40	-		40	-	
Rated service-circuit breaking capacity		Ics(=%Icu)		50			50			50	
Rated peak short-circuit breaking capacity (kA) Icm	AC voltage	415V	74			28			143		
		240V	110			53			275		
Current setting			Fixed			Fixed			Fixed		
Tripping device	Thermal magnetic		○			○			○		
	Hydraulic magnetic										
	Magnetic-only								○		
Trip test button			○			○			○		
Dimension (mm) 		a	210	210		210	210	280	210	210	280
		b	275			275			275		
		c1	109			109			109		
		c2	113			113			113		
		d	145			145			145		
	Weight (kg)		11	11.5		11	11.5	18.2	11	11.5	18.2
Connection (front)			Terminal screw								
Accessories	Auxiliary switch	AL	○			○			○		
	Alarm switch	AX	○			○			○		
	Shunt trip	SHT	○			○			○		
	Undervoltage trip	UVT	○			○			○		
	Rotary handle	N-Type	N-80								
	Terminal cover		○			○			○		
	Insulation barrier		Basic			Basic			Basic		

[1] Ratings are interchangeable with the values in by replacing rating plug.

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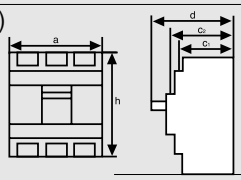
Specification

1000A
1200A

Type			S-Type		L-Type		S-Type		L-Type	
			ABS1003	ABS1004	ABL1003	ABL1004	ABS1203	ABS1204	ABL1203	ABL1204
Rated insulation voltage (V)		Ui	690		690		690		690	
Rated impulse voltage (kV)		Uimp	6		6		6		6	
Rated maximum operating voltage (V)		Ue	600		600		600		600	
Number of poles			3	4	3	4	3	4	3	4
Rated current at 40℃ (A)		In	1000		1000		1200		1200	
Rated ultimate breaking capacity Icu according to IEC947-2	AC voltage	690V	-		-		-		-	
		600V	45		65		45		65	
		500V	50		75		50		75	
		415V	65		85		65		85	
		380V	65		85		65		85	
		240V	100		125		100		125	
	DC voltage	250V	40	-	40	-	40	-	40	-
Rated service-circuit breaking capacity		Ics(=%Icu)	50		50		50		50	
Rated peak short-circuit breaking capacity (kA) Icm	AC voltage	415V	143		187		143		187	
		240V	220		275		220		275	
Current setting			Fixed		Fixed		Fixed		Fixed	
Tripping device	Thermal magnetic		○		○		○		○	
	Hydraulic magnetic									
	Magnetic-only									
Trip test button			○		○		○		○	
Dimension (mm) 		a	210	280	210	280	210	280	210	280
		b	400		406		400		406	
		c_1	-		-		-		-	
		c_2	105		140		105		140	
		d	158		190		158		190	
	Weight (kg)		19.4	27	23	26	19.4	27	23	26
Connection (front)			Terminal screw							
Accessories	Auxiliary switch	AL	○		○		○		○	
	Alarm switch	AX	○		○		○		○	
	Shunt trip	SHT	○		○		○		○	
	Undervoltage trip	UVT	○		○		○		○	
	Rotary handle	N-Type			-				-	
	Terminal cover		-		-		-		-	
	Insulation barrier		Basic		Basic		Basic		Basic	

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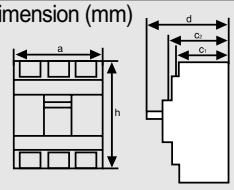
Instantaneous only circuit breaker

Ampere Frame			100AF	225AF	400AF	800AF
Type			L-Type			
			ABL 103aIN	ABL 203aIN	ABL 403aIN	ABL 803aIN
Rated insulation voltage (V)		Ui	690	690	690	690
Rated impulse voltage (kV)		Uimp	6	6	6	6
Rated maximum operating voltage (V)		Ue	600	600	600	600
Number of poles			3	3	3	3
Continuous current (A)			100*	225	400	800
Magnetic release trip setting range (A)			10 to 20 20 to 40 40 to 80 70 to 140 120 to 240 180 to 360 300 to 600 400 to 800 650 to 1300	300 to 600 400 to 800 650 to 1300 1000 to 2100 1350 to 2900	1200 to 3000 1400 to 3500 1600 to 4000	1500 to 3750 2000 to 5000 2400 to 6000 2800 to 7000 3200 to 8000
Rated ultimate breaking capacity Icu according to IEC947-2	AC voltage	690V	-	-	-	-
		600V	35	35	35	42
		500V	42	42	50	50
		415V	65	65	65	65
		380V	65	65	65	65
		240V	100	125	125	125
	DC voltage	250V	40	40	40	40
Rated service-circuit breaking capacity		Ics(=%Icu)	50	50	50	50
Rated peak short-circuit breaking capacity (kA) Icm	AC voltage	415V	143	143	143	143
		240V	220	275	275	275
Mechanical expectancy (times)	Without current		4000	4000	5000	3500
	With current		6000	4000	1000	500
Tripping device	Thermal magnetic		○	○	○	○
	Hydraulic magnetic					
	Magnetic-only		○	○	○	○
Trip test button			○	○	○	○
Dimension (mm) 		a	105	105	140	210
		b	165	165	257	275
		c1	82	99	107	107
		c2	86	103	109	109
		d	109	127	149	149
	Weight (kg)		2.3	2.5	6.2	115
Connection (front)			Terminal screw			
Accessories	Auxiliary switch	AL	○	○	○	○
	Alarm switch	AX	○	○	○	○
	Shunt trip	SHT	○	○	○	○
	Undervoltage trip	UVT	○	○	○	○
	Rotary handle	N-Type	N-55	N-60	N-70	N-80
	Terminal cover		○	○	-	-
	Insulation barrier		Basic	Basic	Basic	Basic

* For more information about the maximum continuous current, go to page B25.

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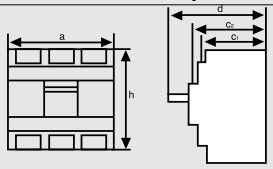
Cirecuit breaker controlled by electronic trip unit

Type					S-Type	
					ABS 803E	ABS 1203E
Rated insulation voltage (V)				Ui	690	690
Rated impulse voltage (kV)				Uimp	6	6
Rated maximum operating voltage (V)				Ue	600	600
Number of poles					3	3
Rated current Adjustable (A)				In	400 500 600 700 800	600 700 800 1000 1200
Current setting					Adjustable	Adjustable
Rated ultimate breaking capacity according to IEC947-2	Icu	AC voltage	690V		45	45
			600V		50	50
			500V		65	65
			415V		65	65
			380V		65	65
			240V		100	100
		DC voltage	250V		50	50
Rated service-circuit breaking capacity		Ics(=%Icu)			50	50
Mechanical endurance (No. of operation)			Without current		2500	2500
			With current		500	500
Tripping device		Thermal magnetic trip				
		Hydraulic magnetic trip				
		Electronic trip			○	○
Trip test button					○	○
Characteristics of tripping					Long time-short time-Instantaneous tripping characteristics	
	Long time	Rated current I_1			400-450-500-600-700-800A	600-700-800-1000-1200A
	Adjustable	Tripping time T_1			5-10-15-20-30 sec. At 6 ×I1	
	Short time	Definite	Rated current I_2		2-4-6-8-10 ×11	
	Adjustable	time	Tripping time T_2		0.1-0.15-0.2-0.25-0.3sec.	
		Inverse	Rated current I_2		2-4-6-8-10 ×11	
		Time(I^2t)	Tripping time T_2		0.1-0.15-0.2-0.25-0.3 sec.at 10 ×11	
	Instantaneous	Rated current (Adjustable) I_3			3-6-9-12 ×Ict	
		Tripping time			Below 0.03 sec.	
	Long time	Rated current (Adjustable) I_g			(0.1 to 0.4) ×Ict (Adjustable continuously)	
	Adjustable	Tripping time T_g			0.1-0.2-0.3-0.4-0.8 sec	
	Long time	Setting current (Adjustable) I_p			0.7-0.8-0.9-1.0 ×I1(AC 110 or 220V : separate operating power)	
		Adjustable			3A (continuous operating current)	
Dimension (mm)				a	210	210
				b	400	400
				c_1	-	-
				c_2	105	105
				d	158	158
				Weight (kg)	17	21
Connection (front)					Terminal screw	
Accessories	LED				Indicating Trip situation	
	Auxiliary swich	AL(W)			○	○
	Alarm switch	AX(K)			○	○
	Shunt trip	SHT(F)			-	-
	Undervoltage trip	UVT(R)			-	-
	Rotary handle	N-Type			-	-
	Terminal cover				-	-
	Insulation barrier				○	○

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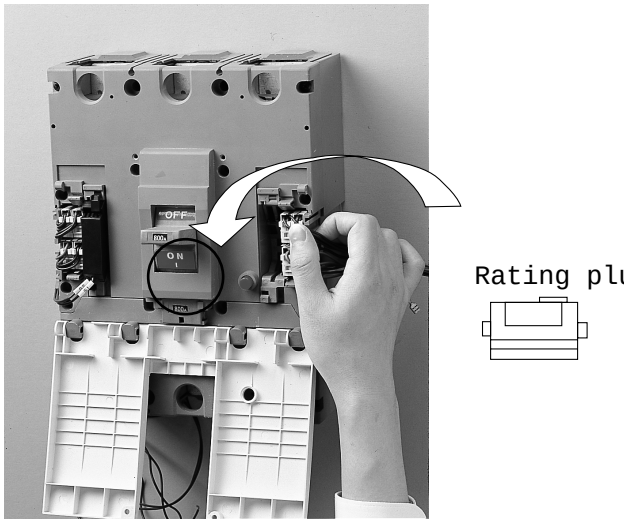
Field-Interchangeable thermal current

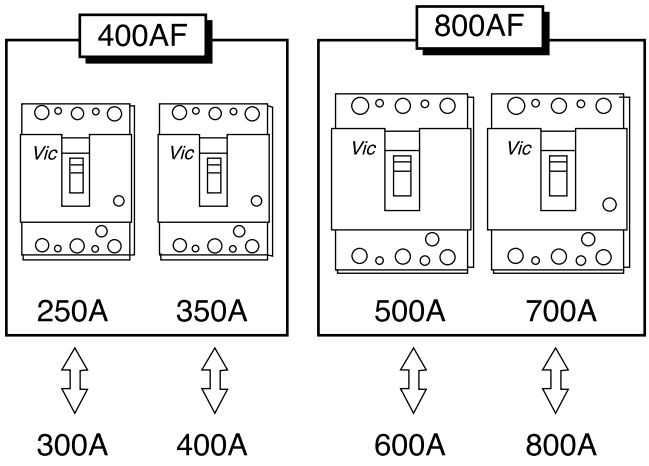
■ Tripping devices

Fixed/ interchangeable thermal current
by the “rating plug”



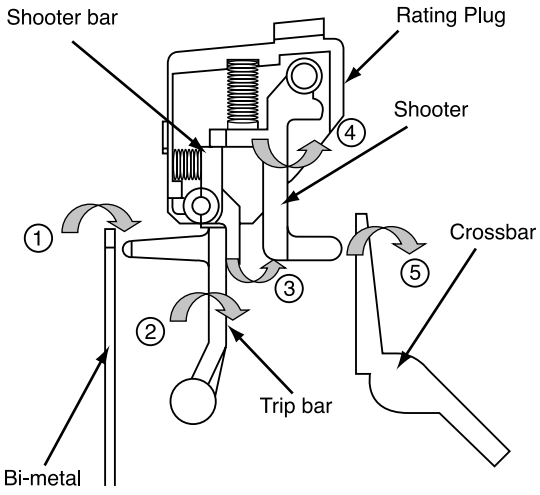
■ Dual current rating

Dual thermal currents are available
by replacing the rating plug



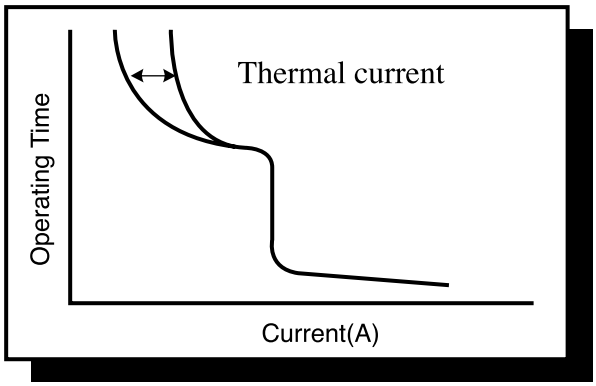
■ Function of the rating plug

tripping sequence by the rating plug



■ Change in the characterstic curve

the rating plug changes the over-load
characteristic



* Thermal currents are changeable by adjusting the gap between trip bar and shooter bar

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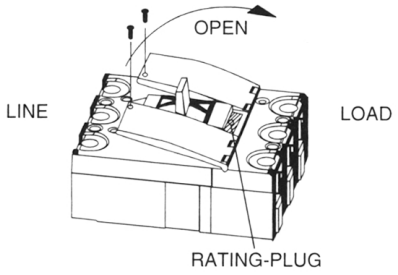
■ Procedure of replacing Rating Plugs

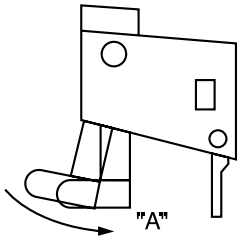
1. Check the rated current of the installed rating plug in the CB and then the rated current you want to replace.
2. Check if it is interchangeable by referring the below table.

TYPE	Rated current interchangeable
ABE 400a ABS 400a ABH 400a ABL 400a	250A ↔300A
	350A ↔400A
ABE 600a/800a ABS 600a/800a ABL 600a/800a	500A ↔600A
	700A ↔800A

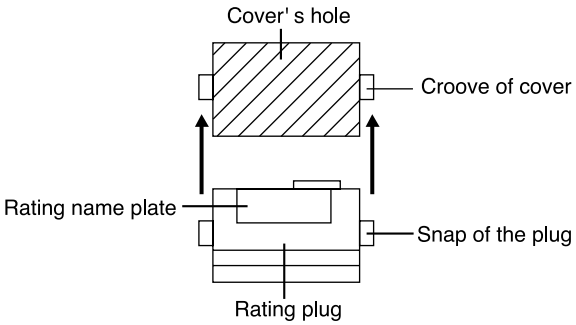
3. Open the Aux. cover by loosening screws as on the picture below.



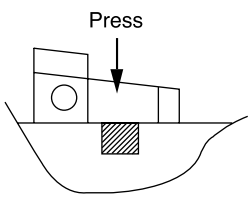
4. Interchanging the rating plugs.
   4.1. Reset the rating plug by pushing the lever into direction A



   4.2. Insert the rating plug in the CB and check the rating nameplate.



   4.3. Please be sure that it is compltely installed.

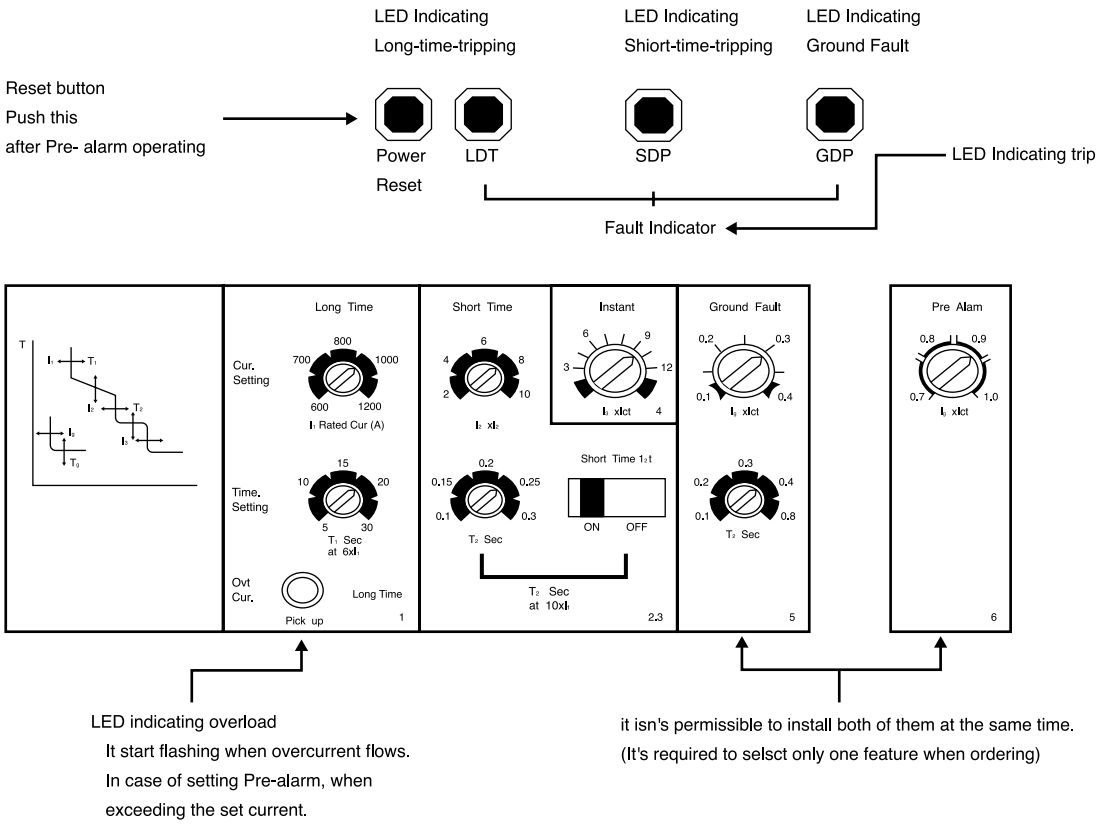


5. Close the Aux.cover by tightening the screws.

■ Description
-Solid state trip, ABS□-E

The electronic MCCB employs built-in solid state trip unit and Current transformer (CT) so that it provided a coordinated protection of the distribution system and can be adapted easily to selective interruption.

■ Features and Functions of electronic trip unit



■ Protective characteristics -800 AF to 1200 AF

● Variable rated current

The rated current can be selected from 50% to 100% of the frame ampere by turning the dial with a screwdriver.

Ampere Frame	Selectable range of the rated current (A)
800AF	400/500/600/700/800
1200AF	600/700/800/1000/1200

● Wide paramater setting ranges

The rated current and the operating time of the long-time-delay tripping can be selected easily by tripping can be selected easily by turning a dial with a flattip screwdriver.

● Overload current pre-alam

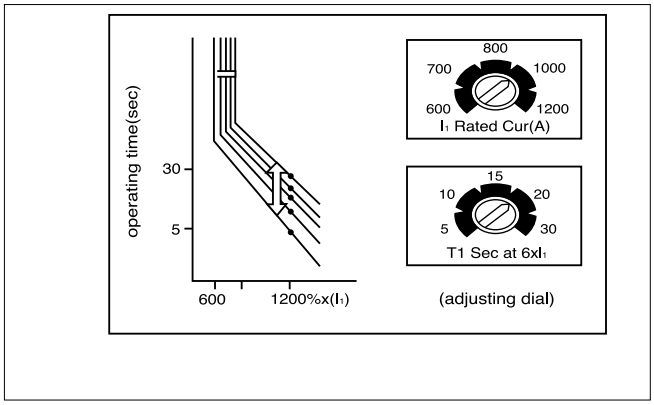
These breakers always monitor the load current and alarms if the set current is exceeded.

● Selective tripping characteristics

These breakers have four tripping characteristics patterns. It gives the strong points in coordinating the breaker and other protective devices.

☞ Long time tripping characteristics

It is available to adjust the rated current and the operating tripping time according to the loads. It can be selected from 600% to 1200% of the rated current (In) and 5 to 30 seconds of the tripping time by turning a dial.

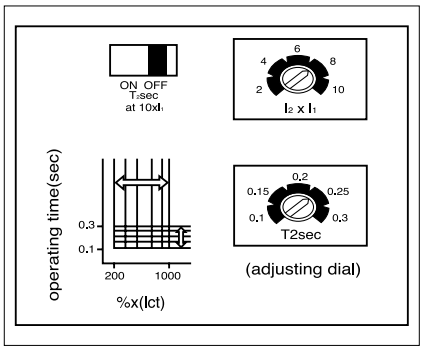


Circuit breaker controlled by electronic trip unit

☞ Short time tripping characteristics

(coordinated with circuit breakers controlled by electronic trip unit.)

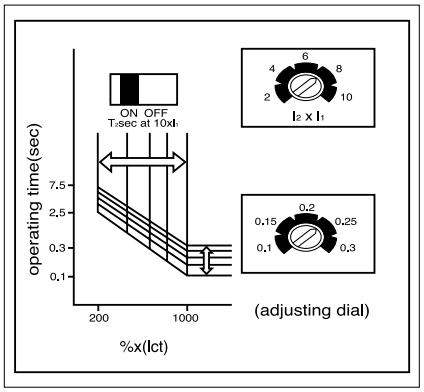
It is available to adjust the rated current and the operating tripping time according to the loads. Short-time-delay tripping current can be selected from 200 to 1000% of the rated current and the tripping time can be from 0.1 to 0.3 seconds by turming a dial.



☞ Short time tripping characteristics

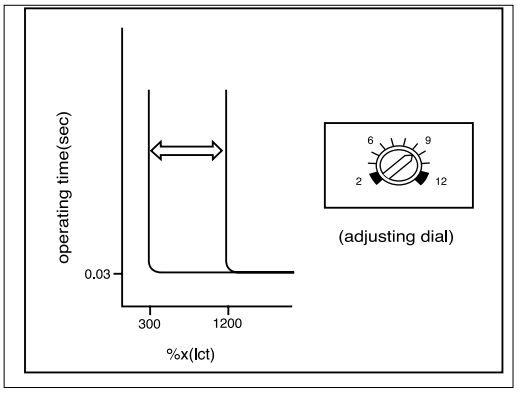
(coordinated with thermal circuit breakers or fuses.)

It is available to adjust the rated current and the operating tripping time according to the loads. Short-time-delay tripping current can be selected from 200 to 1000% of the rated current and the tripping time can be from 0.1 to 0.3 seconds by turming a dial. The tripping time is set under the 1000% of the rated current.



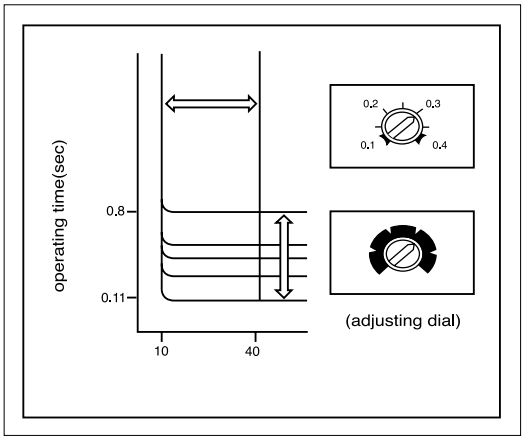
☞ Instantaneous tripping characteristics

It is available to adjust the rated current according to the loads. The instantaneous tripping current can be selected 300 to 1200% of the rated current (Ict).



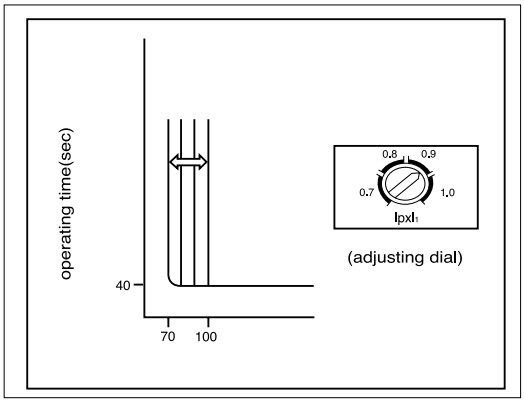
☞ Ground fault tripping characteristics (On request)

It is available to adjust the rated current and the operating tripping time according to the loads. The ground fault tripping current can be selected from 10 to 40% of the rated current and the tripping time can be from 0.1 to 0.8 seconds.



☞ Overload current pre-alarm (On request)

It is available to adjust the rated current according to the loads. Pre-alarm is selected from 70 to 100% of the rated current. But it requires the separated power source (AC 110V or 220V) and it s not allowed to be used with ground fault charateristics simultaneously.

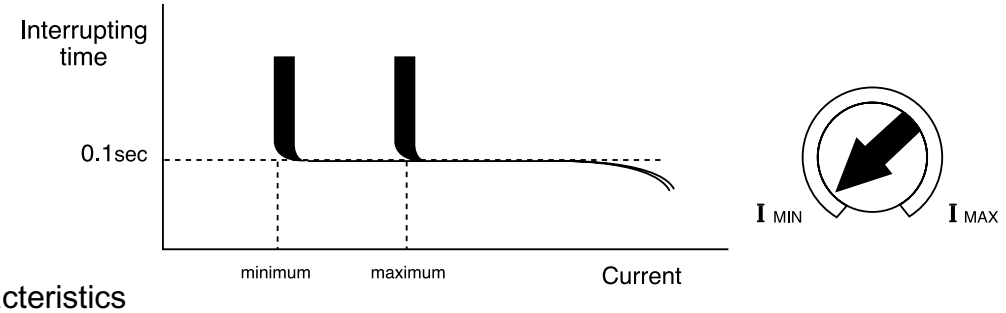


※ Long-time & Short-time tripping characteristics devices are provided basically, but it requires to select ground fault tripping device or overload current pre-alram tripping device before ordering.

■ Description - ABL□a-IN

Magnetic-only breakers have the function of only magnetic trip actions, without thermal trip elements. They are equipped with front-adjustable magnetic trip elements and used where only short circuit protection is required. Because the adjustment features allow closer short circuit protection, these breakers are commonly preferred for motors and resistance welder circuits.

■ Specification



● Characteristics

Type	Magentic release Trip current (A)	Tolerance in setting trip current (A)		Rated thermal current in setting trip current (A)	
		at the I min.	at the I max.	at the I min.	at the I max.
ABL 103aIN	10...20	8~12	16~24	6	10
	20...40	16~24	32~48	12	20
	40...80	32~48	64~96	24	40
	70..140	56~84	112~168	42	70
	120...240	96~144	192~288	72	100
	180...360	144~216	288~432	100	100
	300...600	240~360	480~720	100	100
	400...800	320~480	640~960	100	100
	650...1300	520~780	1040~1560	100	100
ABL 203aIN	300...600	240~360	480~720	180	225
	400...800	320~480	640~960	225	225
	650...1300	520~780	1040~1560	225	225
	1000...2100	800~1200	1680~2520	225	225
	1350...2900	1080~1620	2320~3480	225	225
ABL 403aIN	1200...3000	960~1440	2400~3600	400	400
	1400...3500	1120~1680	2800~4200	400	400
	1600...4000	1280~1920	3200~4800	400	400
ABL 803aIN	1500...3750	1200~1800	3000~4500	800	800
	2000...5000	1600~2400	4000~6000	800	800
	2400...6000	1920~2880	4800~7200	800	800
	2800...7000	2240~3360	5600~8400	800	800
	3200...8000	2560~3840	6400~9600	800	800

* The operating range is ±20% of the instantaneous trip current
* It requires to specify the operating range when ordering.
For example : ABL 103aIN / 70-140A AX.AL

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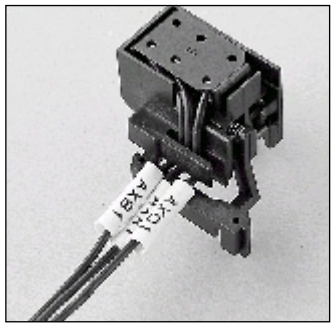
Accessories

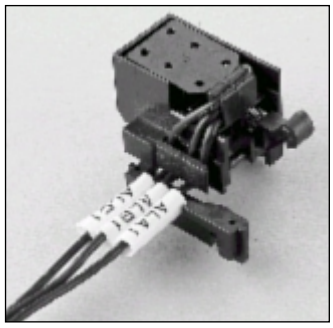
■Alarm Switch, AL

The alarm switch monitors the trip situation of circuit breaker and provides remote signaling. This operates when the circuit breaker is tripped by a short-circuit or overcurrent and when also tripped by a shunt trip or undervoltage trip.
This consists of more than one changeover contacts assembled to a plug-in module in retaining slots in the tip of the rtip unit. When the circuit breaker trips, the make contact closes and the break contacts opens.



■Auxiliary Switch, AX

The auxiliary switch indicates the circuit breaker operating status remotely, therefore is used for remote signaling and control purpose. This indicates the position of the circuit contacts, whether open or closed.
This consists of more than one changeover contacts assembled to a plug-in module in retaining slots in the top of the trip unit. Each changeover contacts has one NO and one NC contact, when the circuit breaker contacts are open, the NO contact is closed.



●Rating of Auxiliary, Alarm switch

Circuit breaker		AC operated			DC operated			Loads applied at minimum
		Voltage (V)	Current of Open/Colsed		Voltage (V)	Current of Open/Colsed		
Molded case circuit breaker	Earth leakage circuit breaker		Inductive Loads	Resistive Loads		Inductive Loads	Resistive Loads	
ABE 3□								
ABE 5□a to ABE 20□a	EBE 53 to EBE 203	125	5	4	30	3	2	
ABS 3□a to ABS 20□a	EBS 33 to EBS 203	125	5	4	125	0.4	0.1	
ABH 3□a to ABH 20□a	EBH 33 to EBH 203	125	2	1	250	0.2	0.03	DC5V
ABL 3□a to ABL 20□a	EBL 33 to EBL 203							160mA
ABE 40□a, ABE 80□a	403 SRG to 803SGR							(100mA)
ABS 40□a, ABS 80□a		125	1	3	30	1	2	
ABS 40□a		250	0.5	2	125	0.2	0.4	DC 30V
ABL 40□a, ABL 40□a								30mA
ABS 100□a to ABS 120□	1003 SGR to 1203 SGR	125	20	20	30	6	5	(100mA)
ABL 100□ to ABL 120□		250	20	20	125	0.4	0.05	
ABS 803E to ABS 1203E		500	10	5	250	0.2	0.03	

* The above described □ represents the number of poles in each type. (2,3,4 pole)

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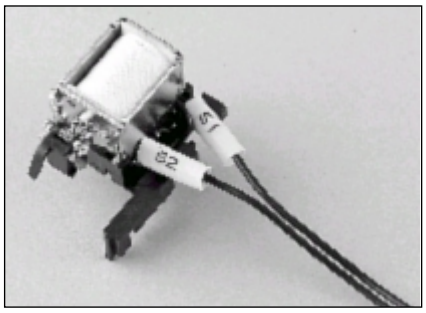
■ Shunt trip, SHT

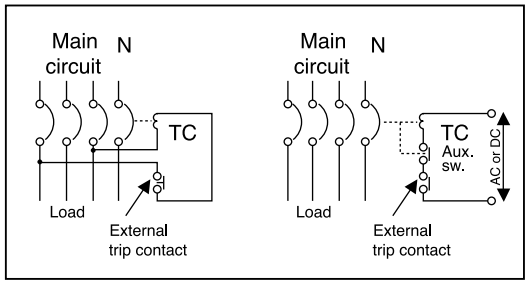
The shunt trip provides remote controlled tripping of the circuit breaker. The coil of shunt trip is dimensioned for continuous operation as well as short-time operation. In case of continuous operation, there is a timer/switching circuit assembled to a plug-in module.



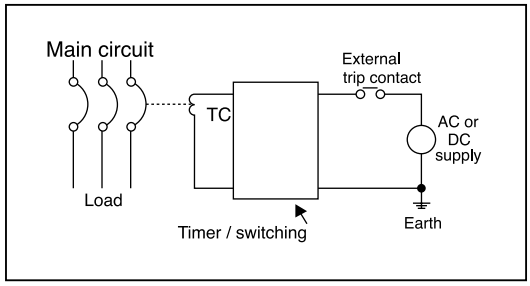
The operating voltage is ;
85% to 110% of the rated voltage in AC
75% to 125% of the rated voltage in DC.

● Characteristics of coil

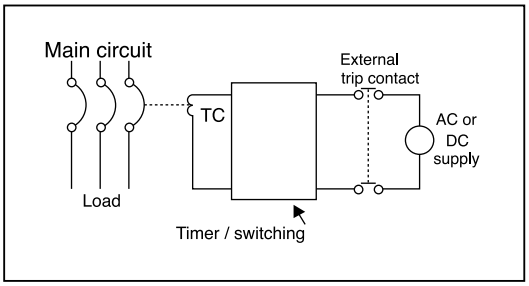
☞ Coil for short-time operation
It requires to make the connection different according to the operating power source.



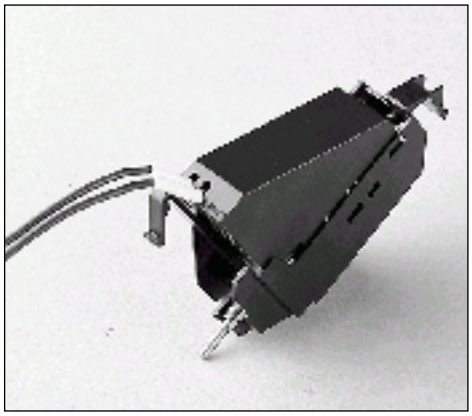
☞ Coil for continuous operation
In case of the continuous operation. The timer/switching circuit, assembled to a plug-in module, automatically breaks the coil current, even when the voltage is continuously applied to the coil. It requires to be turned the power off when making the circuit breaker to work again in continuous operation.



☞ Interlock circuit
It is permissible with the circuit breaker not to close while the voltage is applied to the shunt trip with connection an interlock circuit.
Exception for ;
ABS100□, ABS120□
ABS803E, ABS1203E



■ Undervoltage trip, UVT



The undervoltage trip is designed to operate when the control voltage drops below a tripping threhold. This is also used for remote control purpose.

The operating threshold is ;

20% to 70% of the rated voltage in AC

20% to 70% of the rated voltage in DC.

Therefore, Circuit breaker closing is possible only if the voltage exceeds 85% of the rated voltage.

● Rating of shunt trip

Type	Rated voltage			Time rating of coil
	AC/DC common use	AC only	DC only	
ABE 3□, 5□a, 6□a, 10□a, 20□a ABS 3□a, 5□a, 6□a, 10□a, 20□a ABH 3□a, 5□a, 10□a, 20□a ABL 20□a	AC/DC 12V AC/DC 24V AC/DC 48V AC/DC 60V AC 100 to 125V/DC 100 to 110V AC 200 to 240V/DC 200 to 220V AC/DC 250V	380V to 440V 440V to 480V 500V to 550V	125V 240V	continuous
ABE 40□a, 80□a ABS 40□a, 80□a ABH 40□a ABL 40□a, 80□a	AC/DC 240V to 48V AC 100 to 125V/DC 100 to 110V AC 200 to 240V/DC 200 to 220V	380V to 450V 440V to 480V		continuous
ABS 1003, 1203		100V to 110V 200V to 220V 380V to 440V	24V 48V 100 to 110V 200 to 220V	continuous

● Rating of Under voltage trip

Type	Rated voltage			Time rating of coil
	AC/DC common use	AC only	DC only	
ABE 3□, 5□a, 6□a, 10□a, 20□a ABS 3□a, 5□a, 6□a, 10□a, 20□a ABH 3□a, 5□a, 10□a, 20□a ABL 20□a	AC/DC 24V AC/DC 48V AC/DC 60V AC 100 to 110V AC 200 to 220V	380V to 440V 440V to 480V		continuous
ABE 40□a, 80□a ABS 40□a, 80□a ABH 40□a ABL 40□a, 80□a	AC/DC 48V AC 100 to 125V/DC 100 to 110V AC 200 to 240V/DC 200 to 220V	380V to 450V 440V to 480V		continuous
ABS 1003, 1203		100V to 110V 200V to 220V 380V to 440V	100V 200V	continuous

* The above described □ represents the number of poles in each type. (2,3,4 pole)

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Accessories

■ Selection & Ordering table (30 to 225A)

Applicable Circuit Breaker	Accessories	Type	Specification	Installing Location	Ordering Number	
					Lead wire type	Thrminal block type
ABS32a ABS33a EBE33 ABH32a ABH33a EBH33	Auxiliary Switch	AX	1NO+NC	Left (R phase)	BA8100501	BA8100511
				Right(T phase)	BA8100504	BA8100514
ABE52a ABE53a EBE53	Alarm Switch	AX	1NO+NC	Left (R phase)	BA8100502	BA8100512
				Right(T phase)	BA8100505	BA8100515
ABS52a ABS53a EBS53	Auxiliary + Auxiliary Switch	AL	2NO+NC	Left (R phase)	BA8100503	BA8100513
				Right(T phase)	BA8100506	BA8100516
ABE62a ABE63a EBE63 ABS62a ABS63a EBE63 ABE102a ABE103a EBE103	Shunt trip	SHT	AC/DC 12V	Right(T phase)	BA8200501	
			AC/DC 24V		BA8200502	
			AC/DC 48V		BA8200503	
			AC/DC 60V		BA8200504	
			AC 100 to 125V/DC 100 to 110V		BA8200505	
			DC 125V		BA8200506	
			AC 200 to 240V/DC 200 to 220V		BA8200507	
			DC 240V		BA8200508	
			AC/DC 250V		BA8200509	
			AC 380 to 440V		BA8200510	
			AC 440 to 480V		BA8200511	
			AC 500 to 550V		BA8200512	
	Undervoltage trip	UVT	AC/DC 24V			BA8200701
			AC/DC 48V			BA8200702
			AC 100 to 125V/DC 100 to 110V			BA8200703
			AC 200 to 240/DC 200 to 220V			BA8200704
			AC 380 to 440V			BA8200705
			AC 440 to 480V			BA8200706
ABS54a ABS64a ABE104a	Auxiliary Switch	AX	1NO+NC	Left(R phase)	BA8100501	BA8100511
				Right(T phase)	BA8100507	BA8100517
	Alarm Switch	AX	1NO+NC	Left(R phase)	BA8100502	BA8100512
				Right(T phase)	BA8100508	BA8100518
	Auxiliary + Auxiliary Switch	AX	2NO+NC	Left(R phase)	BA8100503	BA8100513
				Right(T phase)	BA8100509	BA8100519
	Shunt trip	SHT	AC/DC 12V	Right(T phase)	BA8200601	
			AC/DC 24V		BA8200602	
			AC/DC 48V		BA8200603	
			AC/DC 60V		BA8200604	
			AC 100 to 125V/DC 100 to 110V		BA8200605	
			DC 125V		BA8200606	
			AC 200 to 240/DC 200 to 220V		BA8200607	
			DC 240V		BA8200608	
			AC/DC 250V		BA8200609	
			AC 380 to 440V		BA8200610	
			AC 440 to 480V		BA8200611	
			AC 500 to 550V		BA8200612	
	Undervoltage trip	UVT	AC/DC 24V	Right(T phase)		BA8200801
			AC/DC 48V			BA8200802
			AC 100 to 125V/DC 100 to 110V			BA8200803
			AC 200 to 240V/DC 200 to 220V			BA8200804
			AC 380 to 440V			BA8200805
			AC 440 to 480V			BA8200806

* It's not available to install accessories to the left in 2 poles circuit breaker.
* SHT & UVT is not available in earth leakage circuit breaker.

Contents Index

■Selection & Ordering table

Applicable Circuit Breaker	Accessories	Type	Specification	Installing Location	Ordering Number	
					Lead wire type	Thrminal block type
ABH52a ABH53a EBH53 ABS102a ABS103a EBS103 ABH102a ABH103a EBH103	Auxiliary Switch	AX	1NO+NC	Left (R phase)	BAB100521	BA8100531
				Right(T phase)	BA8100524	BA8100534
	Alarm Switch	AX	1NO+NC	Left (R phase)	BA8100522	BA8100532
				Right(T phase)	BA8100525	BA8100535
	Auxiliary + Auxiliary Switch	AX+AL	2NO+NC	Left (R phase)	BA8100523	BA8100533
				Right(T phase)	BA8100526	BA8100536
	Shunt trip	SHT	AC/DC 12V	Right(T phase)	BA8200601	
			AC/DC 24V		BA8200602	
			AC/DC 48V		BA8200603	
			AC/DC 60V		BA8200604	
			AC 100 to 125V/DC 100 to 110V		BA8200605	
			DC 125V		BA8200606	
			AC 200 to 240V/DC 200 to 220V		BA8200607	
			DC 240V		BA8200608	
			AC/DC 250V		BA8200609	
			AC 380 to 440V		BA8200610	
			AC 440 to 480V		BA8200611	
			AC 500 to 550V		BA8200612	
	Undervoltage trip	UVT	AC/DC 24V	Right(T phase)		BA8200711
			AC/DC 48V			BA8200712
			AC 100 to 125V/DC 100 to 110V			BA8200713
			AC 200 to 240/DC 200 to 220V			BA8200714
			AC 380 to 440V			BA8200715
			AC 440 to 480V			BA8200716
ABH54a ABS104a ABH104a	Auxiliary Switch	AX	1NO+NC	Left(R phase)	BA8100521	BA8100531
				Right(T phase)	BA8100527	BA8100537
	Alarm Switch	AX	1NO+NC	Left(R phase)	BA8100522	BA8100532
				Right(T phase)	BA8100528	BA8100538
	Auxiliary + Auxiliary Switch	AX	2NO+NC	Left(R phase)	BA8100523	BA8100533
				Right(T phase)	BA8100529	BA8100539
	Shunt trip	SHT	AC/DC 12V	Right(T phase)	BA8200521	
			AC/DC 24V		BA8200522	
			AC/DC 48V		BA8200523	
			AC/DC 60V		BA8200524	
			AC 100 to 125V/DC 100 to 110V		BA8200525	
			DC 125V		BA8200526	
			AC 200 to 240/DC 200 to 220V		BA8200527	
			DC 240V		BA8200528	
			AC/DC 250V		BA8200529	
			AC 380 to 440V		BA8200530	
			AC 440 to 480V		BA8200531	
			AC 500 to 550V		BA8200532	
	Undervoltage trip	UVT	AC/DC 24V	Right(T phase)		BA8200811
			AC/DC 48V			BA8200812
			AC 100 to 125V/DC 100 to 110V			BA8200813
			AC 200 to 240V/DC 200 to 220V			BA8200814
			AC 380 to 440V			BA8200815
			AC 440 to 480V			BA8200816

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Accessories

■Selection & Ordering table (30 to 225A)

Applicable Circuit Breaker	Accessories	Type	Specification	Installing Location	Ordering Number	
					Lead wire type	Terminal block type
ABE202a ABE203a EBE203 ABS202a ABS203a EBS203	Auxiliary Switch	AX	1NO+NC	Left (R phase)	BA8100541	BA8100551
				Right(T phase)	BA8100544	BA8100554
	Alarm Switch	AX	1NO+NC	Left (R phase)	BA8100542	BA8100552
				Right(T phase)	BA8100545	BA8100555
	Auxiliary + Auxiliary Switch	AX+AL	2NO+NC	Left (R phase)	BA8100543	BA8100553
				Right(T phase)	BA8100546	BA8100556
	Shunt trip	SHT	AC/DC 12V	Right(T phase)	BA8200541	
			AC/DC 24V		BA8200542	
			AC/DC 48V		BA8200543	
			AC/DC 60V		BA8200544	
			AC 100 to 125V/DC 100 to 110V		BA8200545	
			DC 125V		BA8200546	
			AC 200 to 240V/DC 200 to 220V		BA8200547	
			DC 240V		BA8200548	
			AC/DC 250V		BA8200549	
			AC 380 to 440V		BA8200550	
			AC 440 to 480V		BA8200551	
			AC 500 to 550V		BA8200552	
	Undervoltage trip	UVT	AC/DC 24V	Right(T phase)		BA8200721
			AC/DC 48V			BA8200722
			AC 100 to 125V/DC 100 to 110V			BA8200723
			AC 200 to 240/DC 200 to 220V			BA8200724
			AC 380 to 440V			BA8200725
			AC 440 to 480V			BA8200726
ABE204a ABS204a	Auxiliary Switch	AX	1NO+NC		BA8100541	BA8100551
				Right(T phase)	BA8100547	BA8100557
	Alarm Switch	AL	1NO+NC	Left(R phase)	BA8100542	BA8100552
				Right(T phase)	BA8100548	BA8100558
	Auxiliary + Auxiliary Switch	AX+AL	2NO+NC	Left(R phase)	BA8100543	BA8100553
				Right(T phase)	BA8100549	BA8100559
	Shunt trip	SHT	AC/DC 12V	Right(T phase)	BA8200641	
			AC/DC 24V		BA8200642	
			AC/DC 48V		BA8200643	
			AC/DC 60V		BA8200644	
			AC 100 to 125V/DC 100 to 110V		BA8200645	
			DC 125V		BA8200646	
			AC 200 to 240/DC 200 to 220V		BA8200647	
			DC 240V		BA8200648	
			AC/DC 250V		BA8200649	
			AC 380 to 440V		BA8200650	
			AC 440 to 480V		BA8200651	
			AC 500 to 550V		BA8200652	
	Undervoltage trip	UVT	AC/DC 24V	Right(T phase)		BA8200821
			AC/DC 48V			BA8200822
			AC 100 to 125V/DC 100 to 110V			BA8200823
			AC 200 to 240V/DC 200 to 220V			BA8200824
			AC 380 to 440V			BA8200825
			AC 440 to 480V			BA8200826

* It's not available to install accessories to the left in 2 poles circuit breaker.
* SHT & UVT is not available in earth leakage circuit breaker.

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■Selection & Ordering table (20 to 225A)

Applicable Circuit Breaker	Accessories	Type	Specification	Installing Location	Ordering Number	
					Lead wire type	Terminal block type
ABH202a ABH203a EBH203 ABL202a ABL203a EBL203	Auxiliary Switch	AX	1NO+NC	Left (R phase)	BA8100561	BA8100571
				Right(T phase)	BA8100564	BA8100574
	Alarm Switch	AX	1NO+NC	Left (R phase)	BA8100562	BA8100572
				Right(T phase)	BA8100565	BA8100575
	Auxiliary + Auxiliary Switch	AX+AL	2NO+NC	Left (R phase)	BA8100563	BA8100573
				Right(T phase)	BA8100566	BA8100576
	Shunt trip	SHT	AC/DC 12V	Right(T phase)	BA8200561	
			AC/DC 24V		BA8200562	
			AC/DC 48V		BA8200563	
			AC/DC 60V		BA8200564	
			AC 100 to 125V/DC 100 to 110V		BA8200565	
			DC 125V		BA8200566	
			AC 200 to 240V/DC 200 to 220V		BA8200567	
			DC 240V		BA8200568	
			AC/DC 250V		BA8200569	
			AC 380 to 440V		BA8200570	
			AC 440 to 480V		BA8200571	
			AC 500 to 550V		BA8200572	
	Undervoltage trip	UVT	AC/DC 24V	Right(T phase)		BA8200731
			AC/DC 48V			BA8200732
			AC 100 to 125V/DC 100 to 110V			BA8200733
			AC 200 to 240/DC 200 to 220V			BA8200734
			AC 380 to 440V			BA8200735
			AC 440 to 480V			BA8200736
ABH204a ABL204a	Auxiliary Switch	AX	1NO+NC	Left(R phase)	BA8100561	BA8100771
				Right(T phase)	BA8100567	BA8100777
	Alarm Switch	AX	1NO+NC	Left(R phase)	BA8100562	BA8100772
				Right(T phase)	BA8100568	BA8100778
	Auxiliary + Auxiliary Switch	AX+AL	2NO+NC	Left(R phase)	BA8100563	BA8100773
				Right(T phase)	BA8100569	BA8100779
	Shunt trip	SHT	AC/DC 12V	Right(T phase)	BA8200661	
			AC/DC 24V		BA8200662	
			AC/DC 48V		BA8200663	
			AC/DC 60V		BA8200664	
			AC 100 to 125V/DC 100 to 110V		BA8200665	
			DC 125V		BA8200666	
			AC 200 to 240/DC 200 to 220V		BA8200667	
			DC 240V		BA8200668	
			AC/DC 250V		BA8200669	
			AC 380 to 440V		BA8200670	
			AC 440 to 480V		BA8200671	
			AC 500 to 550V		BA8200672	
	Undervoltage trip	UVT	AC/DC 24V	Right(T phase)		BA8200831
			AC/DC 48V			BA8200832
			AC 100 to 125V/DC 100 to 110V			BA8200833
			AC 200 to 240V/DC 200 to 220V			BA8200834
			AC 380 to 440V			BA8200835
			AC 440 to 480V			BA8200836

Accessories

■Selection & Ordering table (20 to 225A)

Applicable Circuit Breaker	Accessories	Type	Specification	Installing Location	Ordering Number	
					Lead wire type	Terminal block type
ABL52a ABL53a EBL53 ABL102a ABL103a EBL103	Auxiliary Switch	AX	1NO+NC	Left (R phase)	BAB100581	BA8100591
				Right(T phase)	BA8100584	BA8100594
	Alarm Switch	AX	1NO+NC	Left (R phase)	BA8100582	BA8100592
				Right(T phase)	BA8100585	BA8100595
	Auxiliary + Auxiliary Switch	AX+AL	2NO+NC	Left (R phase)	BA8100583	BA8100593
				Right(T phase)	BA8100586	BA8100596
	Shunt trip	SHT	AC/DC 12V	Right(T phase)	BA8200581	
			AC/DC 24V		BA8200582	
			AC/DC 48V		BA8200583	
			AC/DC 60V		BA8200584	
			AC 100 to 125V/DC 100 to 110V		BA8200585	
			DC 125V		BA8200586	
			AC 200 to 240V/DC 200 to 220V		BA8200587	
			DC 240V		BA8200588	
			AC/DC 250V		BA8200589	
			AC 380 to 440V		BA8200590	
			AC 440 to 480V		BA8200591	
			AC 500 to 550V		BA8200592	
	Undervoltage trip	UVT	AC/DC 24V	Right(T phase)		BA8200741
			AC/DC 48V			BA8200742
			AC 100 to 125V/DC 100 to 110V			BA8200743
			AC 200 to 240/DC 200 to 220V			BA8200744
			AC 380 to 440V			BA8200745
			AC 440 to 480V			BA8200746
ABL54a ABL10a	Auxiliary Switch	AX	1NO+NC	Left(R phase)	BA8100581	BA8100591
				Right(T phase)	BA8100587	BA8100597
	Alarm Switch	AX	1NO+NC	Left(R phase)	BA8100582	BA8100592
				Right(T phase)	BA8100588	BA8100598
	Auxiliary + Auxiliary Switch	AX+AL	2NO+NC	Left(R phase)	BA8100583	BA8100593
				Right(T phase)	BA8100589	BA8100599
	Shunt trip	SHT	AC/DC 12V	Right(T phase)	BA8200681	
			AC/DC 24V		BA8200682	
			AC/DC 48V		BA8200683	
			AC/DC 60V		BA8200684	
			AC 100 to 125V/DC 100 to 110V		BA8200685	
			DC 125V		BA8200686	
			AC 200 to 240/DC 200 to 220V		BA8200687	
			DC 240V		BA8200688	
			AC/DC 250V		BA8200689	
			AC 380 to 440V		BA8200690	
			AC 440 to 480V		BA8200691	
			AC 500 to 550V		BA8200692	
	Undervoltage trip	UVT	AC/DC 24V	Right(T phase)		BA8200841
			AC/DC 48V			BA8200842
			AC 100 to 125V/DC 100 to 110V			BA8200843
			AC 200 to 240V/DC 200 to 220V			BA8200844
			AC 380 to 440V			BA8200845
			AC 440 to 480V			BA8200846

* It's not available to install accessories to the left in 2 poles circuit breaker.
* SHT & UVT is not available in earth leakage circuit breaker.

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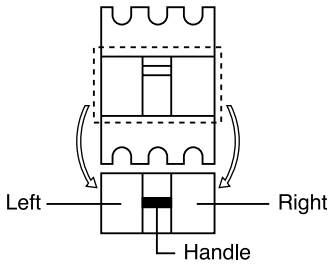
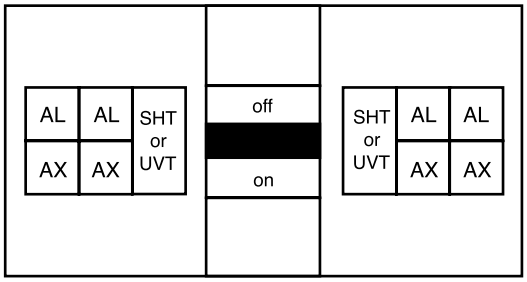
■Selection & Ordering table (400 to 800A)

Applicable Circuit Breaker	Accessories	Type	Specification	Installing Location	Ordering Number	
					Lead wire type	Thrminal block type
ABE402a ABE403a EBE403	Auxiliary Switch	AX1	1NO + NC	Right (T phase)	BA8600501	BA8600601
ABS402a ABS403a EBS403		AX2	2NO + NC		BA8600502	BA8600602
ABH402a ABH403a EBH403	Alarm Switch	AL1	1NO + NC		BA8600503	BA8600603
ABL402a ABL403a EBL403		AL2	2NO + NC		BA8600504	BA8600604
	Shunt trip	SHT	AC/DC 24V to 48V		BA8700501	BA8700601
ABE802a ABE803a EBE803			AC 100 to 240V / DC 100 to 220V		BA8700502	BA8700602
ABS802a ABS803a EBS803			AC 380V		BA8700503	BA8700603
ABL802a ABL803a EBL803	Undervoltage trip	UVT	AC/DC 48V		BA8700521	BA8700621
			AC/DC 100 to 125V / DC 100 to 110V		BA8700522	BA8700622
			AC/DC 200 to 240V / DC 200 to 220V		BA8700523	BA8700623
			AC 380 to 440V		BA8700524	BA8700624
			AC 440 to 480V		BA8700525	BA8700625
ABS404a	Auxiliary Switch	AX1	1NO + NC	Left or Right	BA8600501	BA8060601
ABH404a		AX2	2NO + NC		BA8600502	BA8060602
ABL404a	Alarm Switch	AL1	1NO + NC		BA8600503	BA8060603
		AL2	2NO + NC		BA8600504	BA8060604
ABS804a	Shunt trip	SHT	AC/DC 24V to 48V		BA8700501	BA8700601
ABL804a			AC 100 to 240V / DC 100 to 220V		BA8700502	BA8700602
			AC 380V		BA8700503	BA8700603
			AC/DC 24V to 48V	Right (T phase)	-	BA8700604
			AC 100 to 240V / DC 100 to 220V		-	BA8700605
			AC 380V		-	BA8700606
	Undervoltage trip	UVT	AC/DC 48V	Left or Right	BA8700521	BA8700621
			AC/DC 100 to 125V / DC 100 to 110V		BA8700522	BA8700622
			AC/DC 200 to 240V / DC 200 to 220V		BA8700523	BA8700623
			AC 380 to 440V		BA8700524	BA8700624
			AC 440 to 480V		BA8700525	BA8700625
			AC/DC 48V	Right (T phase)	-	BA8700626
			AC 100 to 125V / DC 100 to 110V		-	BA8700627
			AC 200 to 240V / DC 200 to 220V		-	BA8700628
			AC 380 to 440V		-	BA8700629
			AC 440 to 480V		-	BA8700630

■Available configurations

AF	30~225				400~800
Position & Symble					
Installation	Type	E	ABE 52a ABE 62a ABE102a	ABE 53a ABE 63a ABE104a ABE225a		■ Maximum 10 accessories are availble – 4 × AX,4 × AL – 2 × SHT or 2 × UVT or 1 × SHT+1 × UVT ■ Attachable regardless of the direction (left or right)
		S	ABS 23a ABS 52a ABS 62a ABS102a	ABS 33a ABS 53a ABS 63a ABS103a ABS225a	ABS 54a ABS 64a ABS104a ABS204a	
		H	ABH 52a ABH102a	ABH 53a ABH103a	ABH 54a ABH104a ABH204a	
		L		ABL203a	ABL204a	
	Pole		2	2.3	4	
	Auxiliary Switch (AX)					
	Alarm Switch (AL)					
	Shunt Trip (SHT)					
	Under Voltage Trip (UVT)					
	AX2					
	AL2					
	AX+AL2					
	AX2+AL2					
	AX+AL					
	AX2+AL					
	AX+SHT					
	AX2+SHT					
	AX+UVT					
	AX2+UVT					
	AL+SHT					
	AL+UVT					
	AX+AL+SHT					
	AX+AL+UVT					

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External Accessories

■ Insulation barrier & Terminal cover

- Insulation barrier (Interphase barrier)

  The insulation barrier is made of material with high dielectric strength. It is used to ensure the electrical clearance between breaker terminals. It also prevents troubles caused by contact of conductive material to the terminals. The insulation barrier can be installed in either of the line-side and load side slots on a breaker without using machine screws or bolts.

  * Provides Insulation between each phase.
  * It s unnecessary to tape around terminals.

- Terminal cover

  A terminal cover assures that bare terminal cannot be touched by hand accidentally. These terminal cover are mounted by insering into the slots of breaker without using machine screws or bolts. These are provided with additional ordering according to your necessity.

  * Provides flnger protection.
  * It is available under request.

■ Dimension & Ordering table

Type	Poles	Insulation barrier			Terminal cover (optional)		
		Type	Quantity(1)	Ordering number	Type	Quantity	Ordering number
ABE52a, ABE62a, ABE102a	2	Interphase barrier	1	BA6105655	TBL-12B	2	BA6105661
ABS32a, ABS52a							
ABH32a							
ABE102a						4(2)	
ABS54a, ABS64a	4		3				
ABE53a, ABE63a, ABE103a	3		2		TBL-13B		BA6105662
ABS33a, ABS53a, ABS63a							
ABH33a							
ABH52a, ABH102a, ABS102a	2		1		TBL-22B	2	BA6205661
ABH53a, ABH103a, ABS103a	3		2		TBL-23B	2	BA6205662
ABH54a, ABH104a, ABS104a	4		3		TBL-24B	2	BA6205663
ABE202a, ABS202a	2	Interphase barrier	1	BA6305655	TBL-33B	2	BA6305662
ABE203a, ABS203a	3		2				
ABE204a, ABS204a	4		3		TBL-34B	2	BA6305663
ABH202a, ABL202a	2	Interphase barrier	1	BA6405655	TBL-43B	2	BA6405662
ABH203a, ABL203a	3		2				
ABH204a, ABL204a	4		3		TBL-44B	2	BA6405661
ABL52a, ABL102a	2	Interphase barrier	1	BA6505655			
ABL53a, ABL103a	3		2				
ABL54a, ABL104a	4		3				
ABE402a, ABS402a, ABH402a, ABL402a	2	Interphase barrier	1	BA6805655			
ABE802A, ABS802A, ABL802A							
ABE403a, ABS403a, ABH403a, ABL403a	3		2				
ABE803A, ABS803A, ABL803A							
ABE404a, ABS404a, ABH404a, ABL404a	4		3				
ABE804A, ABS804A, ABL804A							

*Insulation barrier is provided as basic accessories in packing, but if you need terminal cover you re required to order separately.

(1) The quantity is according to the number of poles and it is for protection the line part.

(2) A terminal cover is provided for protection both of line and load part. It differs according to the number of poles.
esp. In case of ABE 102a, it s used commonly with TBL-12B, but it s packed with 4 terminal covers.

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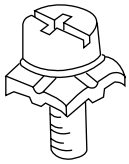
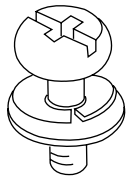
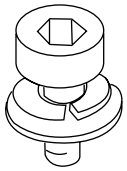
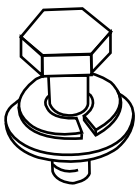
■ Connection-Terminal screw

Connection			Tightening torque	MCCB applied
Terminal feature	Terminal screw	Size		
For connecting with cable	Screw 	M5 ×14	23 to 28	ABE 3□, ABS 3□a, ABE 5□a, ABE 6□a,
		M5 ×14	40 to 50	ABE 10□a, ABS 5□a, ABS 6□a, ABH 3□a,
	Pan-Head Screw 	M8 ×14	55 to 75	ABS 10□a, ABH 5□a, ABH 10□a,
For connecting with busbar	Hexagonal bolt 	M8 ×20	55 to 75	ABE 20□a, ABS 20□a, ABL 20□a, ABH 20□a,
	Hexagonal bolt 	M12 ×35	143	ABE 40□a, ABS 40□a, ABL 40□a ABE 60□a, ABS 60□a, ABL 60□a ABE 80□a, ABS 80□a, ABL 80□a
				ABE 40□, ABS 40□, ABH 40□, ABL 40□ ABE 60□, ABS 60□, ABL 60□ ABE 80□, ABS 80□, ABL 80□, ABS 80□E ABS 100□, ABL 100□ ABS 100□E ABS 120□, ABL 120□, ABS 120□E

*The above described □ represents the number of poles in each type.

Accessories

■Rotary Handle, N-Type

The circuit breaker has a toggle handle operating mechanism, which also serves as switching position indicator - ON, OFF,TRIPPED. But when the circuit breaker is installed in switchgear cubicles or distribution boards, it requires to be operated outside of the switchgear cubicles or distribution boards.

● Features

☞ Easy operation

☞ Door interlock mechanism

It doesn t allow the circuit breaker to be ON when the door of switchgear cubicles or distribution boards is open.

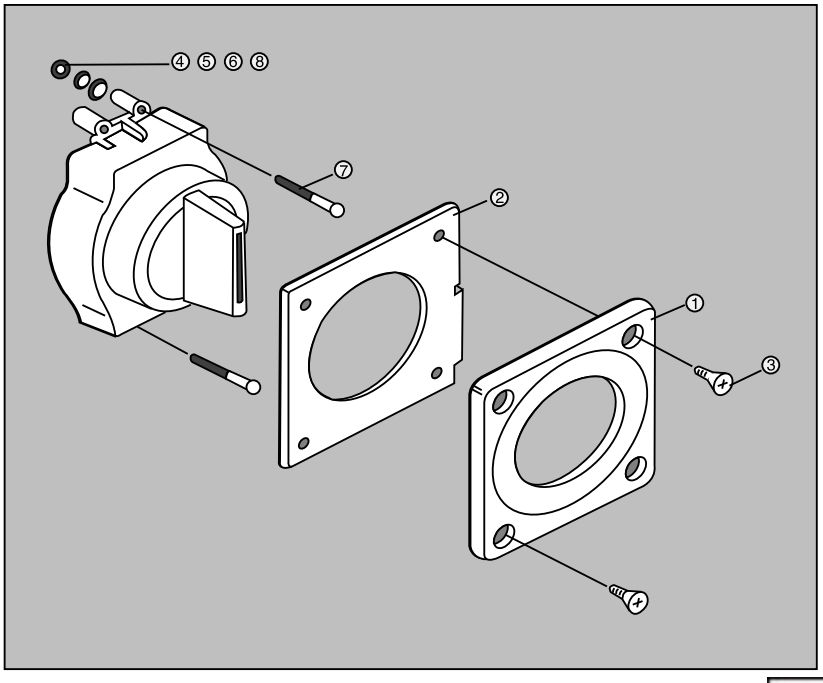
☞ Options

Lock Lever Packing on request

● Application

The mechanism is designed for direct attachment to the circuit breakers and transform the toggle handle movement into a rotation. It is assembled to the swichgear cubicles or distri bution bords, therefore it also gives the function of convenient operating the circuit breaker when the circuit breaker is installed in swichgear cubicles or distribution boards.

● Internal consistency



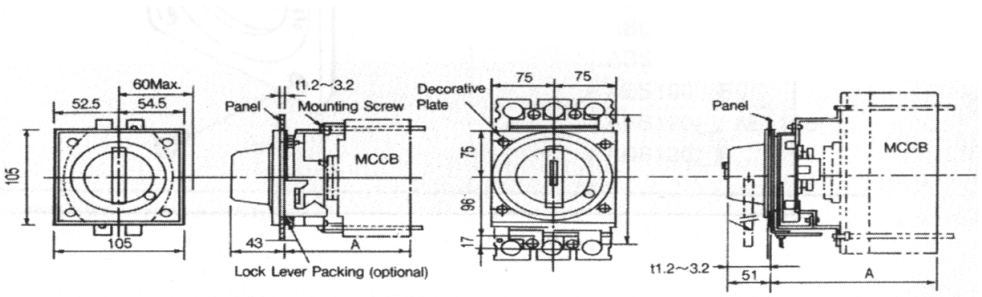
■Accessories table-N Handle

Molded case Circuit breaker	Earth leakage circuit breaker	Ordering number		Common Part	Special Parts
ABH 3□a ABS 3□a ABE 5□a ABS 5□a ABE 6□a ABS 6□a ABE 10□a	EBH 33 EBS 33 EBE 53 EBS 53 EBE 63 EBS 63 EBE 103	N-30-S N-30-L N-30-R	BA8300501 BA8300502 BA8300503	①Front plate 1EA ②Locking plate 1EA ③Countersink head 4EA ④M4 washer 4EA ⑤M4 spring washer 4EA ⑥M4 nut 4EA	⑦Screw M4*70 2EA M4*92 2EA M4*85 2EA M4*110 2EA ⑧Nut M4 special 2EA
ABH 5□a ABS 10□a ABH 10□a	EBH 53 EBS 103 EBH 103	N-40-S N-40-L N-40-R	BA8300511 BA8300512 BA8300513		⑦Screw M4*70 2EA M4*92 2EA M4*85 2EA M4*110 2EA
ABE 20□a ABS 20□a	EBE 203 EBS 203	N-50-S N-50-L N-50-R	BA8300521 BA8300522 BA8300523		⑦Screw M4*70 2EA M4*85 4EA
ABL 5□a ABL 10□a	EBL 53 EBL 103	N-55-S N-55-L N-55-R	BA8300541 BA8300542 BA8300543		⑦Screw M4*96 2EA M4*110 4EA
ABH 20□a ABL 20□a	EBH 203 EBL 203	N-60-S N-60-L N-60-R	BA8300531 BA8300532 BA8300533		⑦Screw M4*115 2EA M4*125 4EA
ABE 40□a ABS 40□a ABL 40□a		N-70-S N-70-L N-70-R	BA8800501 BA8800502 BA8800503		⑦Screw M6*16 4EA M6*110 4EA ⑧foot
ABE 80□a ABS 80□a ABL 80□a		N-80-S N-80-L N-80-R	BA8800511 BA8800512 BA8800513		⑦Screw M6*16 4EA M6*110 4EA ⑧foot

*The above described □ represents the number of poles in each type.
*S : installing vertically, L : installing horizontally(Left), R : installing horizontally(Right)
*It s not available to install onto 2 Pole-circuit breaker in case of N-30, N-40, N-55

●Dimension

N Handle	A(mm)
N-30	103
N-40	103
N-50	103
N-55	126
N-60	147
N-70	157
N-80	157



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Component and Funtions

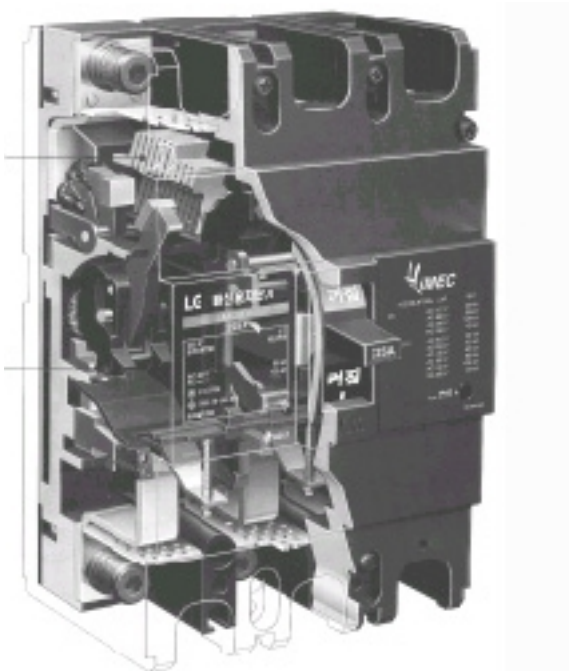
■ Description

Molded case circuit breaker is designed to provide circuit protection. This device is able to make, cary and break currents under normal circuit conditions as well as to make and carry for a specified time and break currents under specified abnormal conditions such as those of short circuit defined by IEC 947-2.

■ Structure

- Characteristics of coil

The are extinguishing devices arc constructed of heat absorbing insulated material and metal grid plates so that those confine, divide and extinguish the arc drawn between opening breaker contacts.



- Operating mechanism

The operating mechanism provides the function of opening and closing the breaker contacts. This means quick-make and quick-break type as well as provides the function of trip free .

☞ Trip Indication
The operating mechanism handle indicates the tripped situation by moving to a position midway between the extremes.

☞ Resetting
After tripped under abnormal conditions, It is required to move the handle to OFF position for resetting.
(It s recommended to reset breaker after 20 to 30 minutes in case of thermal magnetic breaker.)

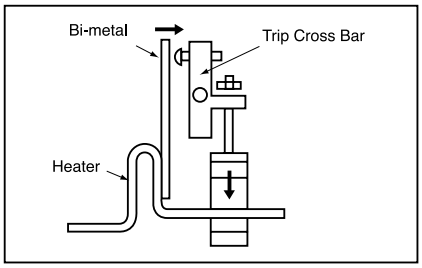
☞ Resetting
Trip free mechanism makes the contacts not to be held closed against an abnormal circuit condition even when the handle is moved to the position ON .

● Trip mechanism

☞ Thermal magnetic trip

Thermal magnetic breakers are tripped by the bimetal heated by the load current. Bimetals is responsive to the heat emitted by the current is responsive to the heat emitted by the current flow so as to cause the operating mechanism to trip on a sustained overload. It also means to allow a long time delay on light overloads.

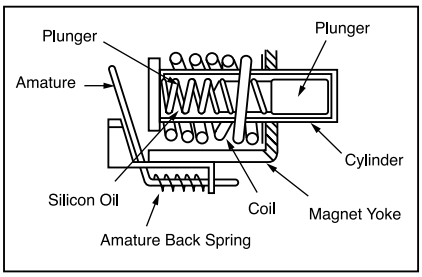
Thermal magnetic breakers are also tripped through the use of electro magnet. This provides an instantaneous tripping action when the current over the predetermined value flows.



☞ Hydraulic magnetic trip

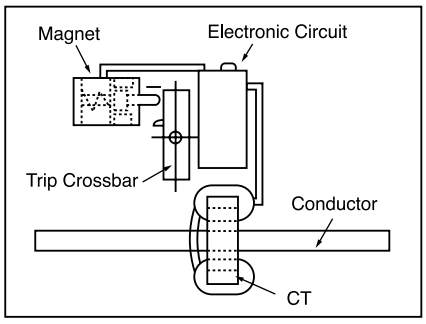
Hydraulic magnetic trip mechanism consists of cylinder assembly, current carrying coil and an armature supported on a yoke. The overcurrent flowing through the coil initiates the movement of plunger, which depends on the extent of the overload. It caused tripping of breakers.

During flow of the short circuit current, the magnetomotive force is so high that the armature is attracted without the movement of the moving core and trips the MCCB instantaneously.



☞ Electronic trip

Electronic trip operation is caused by current transformers and solid state circuitry, which monitors the current and initiates tripping through a flux shunt trip when an overload or short circuit is present.



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Application

■ Application for transformer protection

It s recommended to select proper curcuit breakers according to the continuous current carrying capacity of transformer. It requires to consider separately whether transformer is single phase or 3 phase. The below table indicates the proper molded case circuit breaker suitable for each transformer.

● AC 240V

Capacity of 3 phase transformer (kVA)		Below 30	Below 50	75 to 100	150 to 300	500 to 750	Below 1500	Below 2000
Capacity of single phase transformer (kVA)		Below 16	Below 30	Below 50	Below 150	Below 300		
Breaking capacity (kA) (sym)		2.5	5	10	18	22	25	30	35	42	50	85	100	125
Frame(A)	30	ABE33	ABS33a	ABH33a				
	50	ABE53a		ABS53a ABH53a		ABL53a		
	60	ABE63a		ABS63a				
	100	ABE103a ABS103a				ABH 103a	ABL103a	
	200	ABE203a			ABS203a	ABH203a		ABL203a
	40	ABE403a					ABS403a	ABH403a	ABL403a
	600	ABE803a						ABS803a	ABL803a
	800								
	1000 to 1200	ABS1003, ABS1203 ABL1003, ABL1203						

● AC 415V

Capacity of 3 phase transformer (kVA)		Below 50	75 to 200	Below 300	Below 750	Below 1500	Below 2000	Below 3000
Breaking capacity (kA) (sym)		2.5	5	10	14	18	25	30	35	42	50	60	65	85
Frame(A)	30	ABS33a		ABH33a				
	50	ABE53a		ABS53a	ABH53a	ABL53a		
	60	ABE63a		ABS63a				
	100	ABE103a			ABS103a	ABH103a	ABL103a		
	200	ABE103a			ABS203a		ABH203a		ABL203a	
	400	ABE203a				ABS403a		ABH403a		ABL403a
	600	ABE803a					ABS803a		ABL803a
	800									
	1000 to 1200	ABS1003, ABS1203							ABL1003, ABL1204	

■Application for protection of lighting circuit

It requires to select proper circuit breakers according to short circuit breaking capacity.
It s recommended to make the maximum operating current not to exceed 80% of the rated current.

●AC 240V

The maximum Operating current	The rated current of MCCB	Breaking current (kA) 2.5	5	10	14	18	25	30	35	42	50	60	65	85	100	125
		sym														
2.4	3	ABE33														
4	5	ABS33a	ABH33a													
8	10															
12	15															
16	20															
24	30															
32	40	ABE53a	ABS53a	ABH53a	ABL53a											
40	50															
48	60	ABE63a		ABS63a			ABH103a	ABL103a								
60	75	ABE103a, ABS103a														
80	100															
100	125	ABE203a				ABS203a	ABH203a								ABL203a	
120	150															
140	175															
160	200															
180	225															
200	250	ABE403a							ABS403a		ABH403a				ABL403a	
240	300															
280	350															
320	400															
400	500	ABE803a									ABS803a				ABL803a	
480	600															
560	700															
640	800															
800	100	ABS1003, ABS1203													ABL1003,	
960	1200														ABL1204	

●AC 415V

The maximum Operating current	The rated current of MCCB	Breaking current (kA) 1.5	2.5	5	10	14	18	22	25	35	45	50	60	65	85
		sym													
2.4	3	ABE33	ABS33a	ABH33a											
4	5														
8	10														
12	15				ABH53a	ABL53a									
16	20														
24	30														
32	40	ABE53a		ABS53a											
40	50														
48	60	ABE63a		ABS63a	ABS103a	ABH103a		ABL103a							
60	75	ABE103a													
80	100														
100	125	ABE203a			ABS203a	ABH203a					ABL203a				
120	150														
140	175														
160	200														
180	225														
200	250	ABE403a							ABS403a	ABH403a		ABL403a			
240	300														
280	350														
320	400														
400	500	ABE803a								ABS803a		ABL803a			
480	600														
560	700														
640	800														
800	100	ABS1003, ABS1203												ABL1003,	
960	1200													ABL1204	

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Application

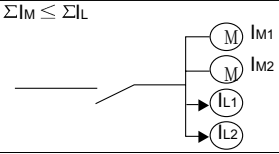
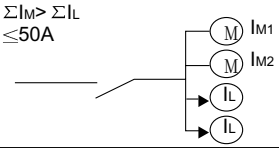
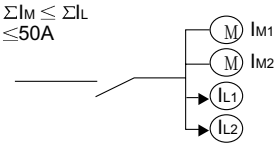
■Application for protection of several loads

It requires to select proper circuit breakers according to the characteristics of loads when they are installed to protect several kinds of loads. It s needed to consider the maximum operating current and the capacity of loads in total so as to select the rated current of breakers.

● The rated current of breakers as the main circuit of 3 phase inductive loads (AC 240V)

Capacity of loads(In total) (kW)	The maximum operating current (A)	Capacity of the highest motor (kW / A)																	
		0.75 4.8	1.5 8	2.2 11.1	3.7 17.4	5.5 26	7.5 34	11 48	15 65	18.5 79	22 93	30 125	37 160	45 190	55 230	75 310	90 360	110 440	132 500
3	**15**	20	30	30															
4.5	**20**	30	30	30	50														
6.3	**30**	40	40	40	50	60													
8.2	**40**	50	50	50	50	75	100												
12	**50**	60	60	60	60	75	100												
15.7	**75**	100	100	100	100	100	100	125	150										
19.5	**90**	100	100	100	100	100	100	125	150	175									
23.2	**100**	125	125	125	125	125	125	125	150	175	200								
30	**125**	150	150	150	150	150	150	150	150	175	225								
37.5	**150**	175	175	175	175	175	175	175	175	200	225	300							
45	**175**	200	200	200	200	200	200	200	200	200	225	300	400						
52.5	**200**	225	225	225	225	225	225	225	225	225	225	300	400	500					
63.7	**250**	300	300	300	300	300	300	300	300	300	300	300	400	500	500				
75	**300**	350	350	350	350	350	350	350	350	350	350	350	400	500	500				
86.2	**350**	400	400	400	400	400	400	400	400	400	400	400	400	500	500	600			
97.5	**400**	500	500	500	500	500	500	500	500	500	500	500	500	500	500	600	700		
112.5	**450**	500	500	500	500	500	500	500	500	500	500	500	500	500	500	700	700		
125	**500**	600	600	600	600	600	600	600	600	600	600	600	600	600	600	700	700	1000	
150	**600**	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	800	1000	1000
175	**700**	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	1000	1000
200	**800**	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	1000

● Selection of circuti breaker protecting the several loads simultaneously

The Kind of loabs (I_M : motors, I_M : others)	Permissible current in cable or wire : I_W	The rated current of circuit breaker:I_b
In case of, $\Sigma I_M \leq \Sigma I_L$ 	$I_W \geq \Sigma I_M + \Sigma I_L$	Choose the low value among two formulas $I_b \geq 3\ \Sigma I_W + I_{L,and}$ $I_b \leq 2{,}5 I_W$ It' s permitted to select the above value only if (above 100A)isn' t subject to the rated current of circuit breaker
In case of, $\Sigma I_M > \Sigma I_L$ $\Sigma I_M \leq 50A$ 	$I_W \geq 1.25\ \Sigma I_M + \Sigma I_L$	
In case of, $\Sigma I_M \leq \Sigma I_L$ $\Sigma I_M \leq 50A$ 	$I_W \geq 1.1\ \Sigma I_M + \Sigma I_L$	

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● The rated current of breakers as the main circuit of 3 phase inductive loads (AC 415V)

Capacity of loads(In total) (kW)	The maximum operating current (A)	Capacity of the highest motor (kW / A)																	
		0.75	**1.5**	**2.2**	**3.7**	**5.5**	**7.5**	**11**	**15**	**18.5**	**22**	**30**	**37**	**45**	**55**	**75**	**90**	**110**	**132**
		4.8	**8**	**11.1**	**17.4**	**26**	**34**	**48**	**65**	**79**	**93**	**125**	**160**	**190**	**230**	**310**	**360**	**440**	**500**
3	**7.5**	15	15	15															
4.5	**10**	15	15	15	30														
6.3	**15**	20	20	20	30	40													
8.2	**20**	20	20	20	30	40	50												
12	**25**	20	20	20	30	40	50												
15.7	**38**	50	50	50	50	50	50	60	75										
19.5	**45**	50	50	50	50	50	50	60	75	100									
23.2	**50**	50	50	50	50	50	50	60	75	100	125								
30	**63**	75	75	75	75	75	75	75	100	100	125								
37.5	**75**	100	100	100	100	100	100	100	100	100	125	150	175						
45	**88**	100	100	100	100	100	100	100	100	100	125	150	175						
52.5	**100**	125	125	125	125	125	125	125	125	125	125	150	175	225					
63.7	**125**	150	150	150	150	150	150	150	150	150	150	150	200	225	250				
75	**150**	175	175	175	175	175	175	175	175	175	175	175	200	225	250				
86.2	**175**	200	200	200	200	200	200	200	200	200	200	200	200	225	300	350			
97.5	**200**	225	225	225	225	225	225	225	225	225	225	225	225	225	300	350	400		
112.5	**225**	250	250	250	250	250	250	250	250	250	250	250	250	250	300	350	400		
125	**250**	300	300	300	300	300	300	300	300	300	300	300	300	300	300	350	400	500	
150	**300**	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	400	500	500
175	**350**	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	500	500
200	**400**	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
250	**500**	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600
300	**600**	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700
350	**700**	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800
400	**800**	800	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900
450	**900**	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
500	**1000**	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200

The above mentioned technical data is defined under the usage conditions as follows ;

1) The circuit breaker is tripped within 10 seconds in 600% of the current of the fully operating loads.
2) The start-up input current is set within 1700% of the current of the fully operating loads.
3) The capacity of highest motor is also applied when several loads starts up simultaneously.

Application

■Application on resistance welding circuits

Short circuit protection for resistance welding devices can be obtained by applying molded case circuit breaker properly. These breakers permit normally high welding currents, but trip instantaneously if a short circuit develops. It s recommended to select proper circuit breaker according to the characteristics of welding devices as the follow table.

Characteristics of welding device		Circuit breaker applied	
Capacity (kVA)	Maximum Input (kVA)	220V (Single phase)	400V (Single phase)
15	35	ABE 102a/100A ABH 102a/100A ABL 102a/100A	ABE 52a/50A ABS 52a/50A ABL 52a/50A
30	65	ABE 202a/125A ABS 202a/125A ABH 202a/125A ABL 202a/125A	ABE 102a/100A ABS 102a/100A ABL 102a/100A
55	140	ABE202a/225A ABS 202a/225A ABH 202a/225A ABL 202a/225A	ABE 202a/100A ABS 202a/100A ABH 202a/100A ABL 202a/100A

■Application for capacitor protection

In normal conditions, It s recommended to set the rated current of circuit breakers as 150% of the rated current of capacitors.

Capacity of capacitor (kVA)	Rated current of breaker							
	Single phase				Three phase			
	240V		415V		240V		415V	
	50Hz	60Hz	50Hz	60Hz ㎐	50Hz	60Hz	50Hz	60Hz
5	50	50	30	30	40	50	30	20
10	75	60	40	40	50	50	30	30
15	100	100	60	50	60	60	40	40
20	175	175	75	60	100	75	50	40
25	200	200	100	100	100	100	50	50
30	225	225	100	100	175	150	60	60
40	400	400	150	125	200	200	100	75
50	400	400	175	175	225	225	100	100
75	600	500	300	300	400	400	225	225
100	700	800	400	400	400	400	225	225
150	1000	100	600	500	600	600	300	300
200	-	-	800	800	800	800	400	400
300	-	-	1000	1000	-	-	600	600
400	-	-	-	1200	-	-	-	800

(1) It indicates that it s available to apply to short-circuit breaking capacity of up to 42kA.
∗ The input current at capacitor s circuit making changes according to the inductive reactance of circuit.
∗ It s possible to apply to short-circuit breaking capacity to the maximum of each circuit breaker.

■Application to DC circuits

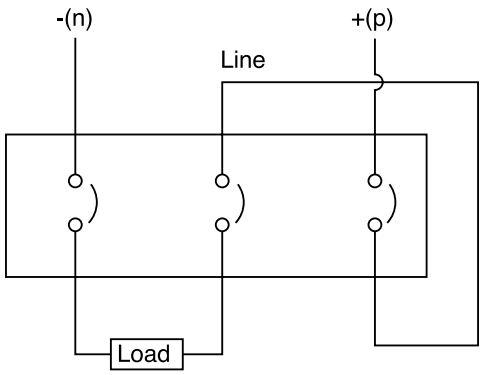
It s available to use some of the circuit breakers in DC circuit conditions according to the trip method.

●DC 250V

Type	Circuit breaker applied	Applicabilty	
		As standard	Under special Ordering
Hydraulic Magnetic Trip	ABE33, ABE53a, ABE63a, ABE103a ABS33a, ABS53a, ABS63a ABH33a, ABH53a,	None	○
Thermal Magnetic Trip	ABE203a, ABE403a, ABE803a ABS103a, ABS203a, ABS403a, ABS803a ABH103a, ABH203a, ABH403a, ABL103a, ABL203a, ABL403a, ABL803a ABS1003, ABS1203 ABL 1003, ABL1203	○	None
Electronic Trip	ABS803E, ABS1203E	None	None

●DC 500V

Because there isn t the zero point in the characteristics of time-current curves of circuit breakers used in DC circuit conditions, It s more difficult to break the circuit controlled by high voltage than in AC circuit conditions. But even if the operating voltage should be set as DC 250V to the maximum in general usage, it s possible to use breakers under DC 500V only if connecting breakers like the below figure.



Type	Poles	Rated voltage (V)	Short circuit breaking capacity (kA)
ABS53a ABE103a	3	DC500V	5
ABE203a			10
ABE403a, ABE803a ABS403a			20
ABS803a ABL403a, ABL803a ABH403a ABS1003, ABS1203(1)			40

(1) It s allowed to use circuit breakerin circuit operated by DC 500V especially only in instantaneous trip.

Application Information

■Application to 400Hz systems

When circuit breakers are used in the situation of high frequency, those breakers in many case require to be derated due to the increased resistance of the copper sections resulting from the skin effect produced by eddy currents at 400Hz.

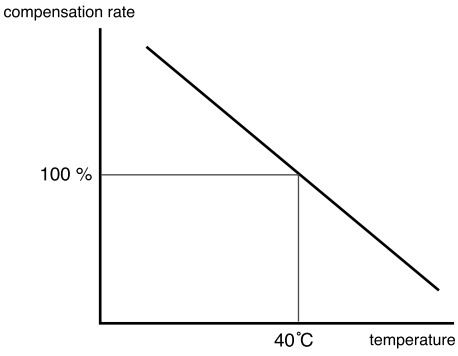
☞ Thermal trip characteristics
The continuous current carrying capacity and tripping current decreased due to the increased resistance of the copper sections resulting from the skin effect produced by eddy currents at 400Hz. The amount of decrease of those characteristics differs according to each molded case circuit breaker, but It s recommended to derate as 80% in the usage of the maximum rated current and 90% in the usage of half rated current.

☞ Instantaneous trip characteristics
In case of instantaneous trip characteristics in 400Hz, The tripping value by overcurrent increase according to high frequency. The value in 400Hz will be generally 2 times higher than in 60Hz.

● Derating table

NO	Rated current(A) in 400Hz	Circuit breaker applied	Rated current of the circuit breaker of your ordering	
			In using the Max.	In using the Half.
1	15	ABH 53a, ABL 103a	20	20
2	20	ABL 53a, ABH 103a	30	30
3	30		40	40
4	40		50	50
5	50		75	60
6	60		75	75
7	75		100	100
8	100		125	125
9	125	ABE 203a	175	150
10	150	ABS 203a	200	175
11	175	ABH 203a	225	200
12	200	ABL 203a	250	225
13	225		300	250
14	300	ABE 403a	350	300
15	400	ABS 403a	400	350
16	350	ABH 403a	500	400
17	600	ABL 403a	500	500
18	500		-	600

■Compensation by temperature



Molded case circuit breakers are rated in r.m.s. amperes at a special ambient. The rated current of breakers are calibrated for an ambient temperature 40℃ , which is the average temperature within an enclosure. Therefore, when used under the various temperature conditions, it requires to compensate temperature in order to determine the characteristics of operation.

● Breakers with hydraulic magnetic trip device

The operation current for tripping at temperatures other than 40℃ will remain unaltered. However, the operating time will change by ambient temperatures according to the compensation curves.

For example :
If the tripping device is adjusted at an ambient temperature of 40℃, the operating time will be increased to 120% of the standard time when It is used at ambient temperature of 30℃.

● Breakers with thermal magnetic trip device

Even though the operating time remains unchanged at the temperatures other than 40℃, the operating current will be changed. Therefore, It needs to compensate the rated current.

● Breakers controlled by electronic trip device

These breakers are not influenced by the ambient temperature.

■Unusual operation conditions

● Low ambient temperature

When breakers are used in the ambient temperature above -20℃, The function of making and closing contacts or short circuit breaking is not influenced. But even if it s possible to store breakers in the ambient temperature -40℃, the characteristics of operation will be changed.

● High ambient temperature

Thermal magnetic breakers are sensitive to temperature and are calibrated for a specific ambient of 40℃ under normal conditions. If the ambient temperature gets higher than 40℃, it will cause the breaker to carry less current than its name-plate rating and reduce its safety current carrying capacity so that it requires to derate the rated current or the operating time of breakers.

● Moisture - Corrosion

A special treatment of breakers is recommended when used in the place where there is high moisture content or/and fungus growth is pervalent.

● Attitude

It is recommended to use breakers at attitude below 2,000m. If above 2,000m, breakers must be derated for interrupting insulating, current-carrying capacity and interrupting ability.

■Influence in unusual conditions

Unusual conditions	Influence
Low ambient temperature	● Transformation by freeze ● Decline of mechanical strength
High ambient temperature High moisture	● Corrosion ● Decline of insulating resistance ● Faulty operation
Corrosive gas, Salinity	● Corrosion ● Decline of insulating resistance ● Faulty operation of contacts
Dust, Vapor	● Faulty operation of contacts ● Decline of insulating resistance ● Faulty operation of mechanism

■Connection

● Influence by distance between breakers

It is possible to mount several circuit breakers side by side on to panel. In that case, the characteristics of operation doesn t change even if they are arranged narrowly. But the change of characteristics of time-current for tripping might occur by the thermal factor which is generated between breakers. Therefore, it s recommended to consider the distance for insulation between circuits breakers when mounting side by side.

● Reverse connection

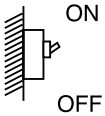
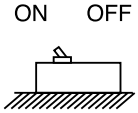
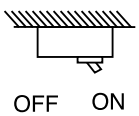
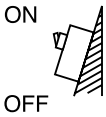
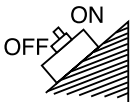
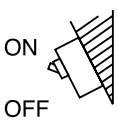
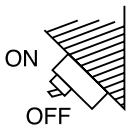
In case of connecting with main line and load, it is not available to select the incoming and outgoing side on the circuit breakers as desired.

■Influence by mounting position

It needs to mount the circuit breakers under various conditions. In that case, It is recommended to consider the position and other factors which influence the characteristics of circuit breakers with hydraulic magnetic trip device. In sepecial, the characteristics of rated current might change by the installing position. It results from the gravity which influences the plunger in oil dash pot of hydraulic magnetic trip device.

It is recommendable to compensate the rated current according to the below table.

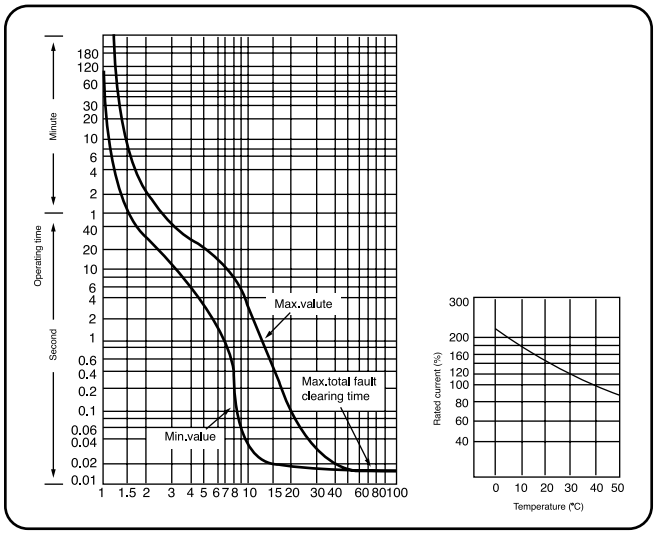
●The compensation rate of the rated current

Type	Vertical	Horizontal	Rezerse-horizontal	Back-biased (15°)	Bavk-biased (45°)	Fore-biased (45°)	Fore-biased (45°)
ABE 3 ABE 5□a ABE 5□a ABE 6□a ABS 6□a ABE 10□a							
	100%	120%	80%	105%	110%	95%	85%

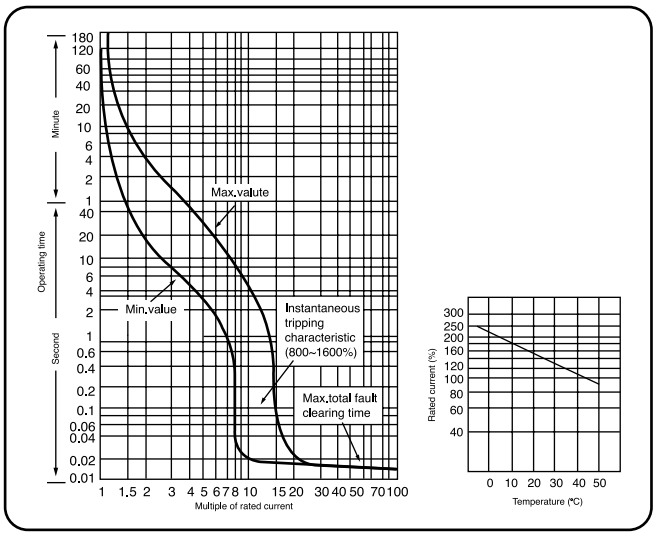
Techanical data

■Characteristic curve, Ambient Compensation curve

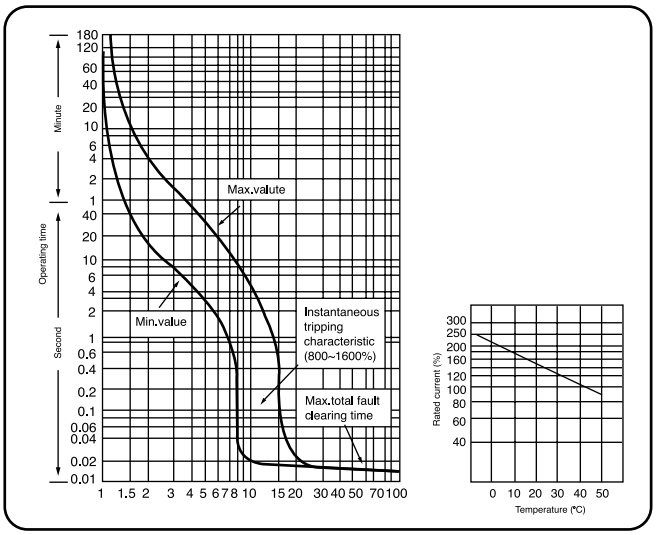
ABE32, ABE33



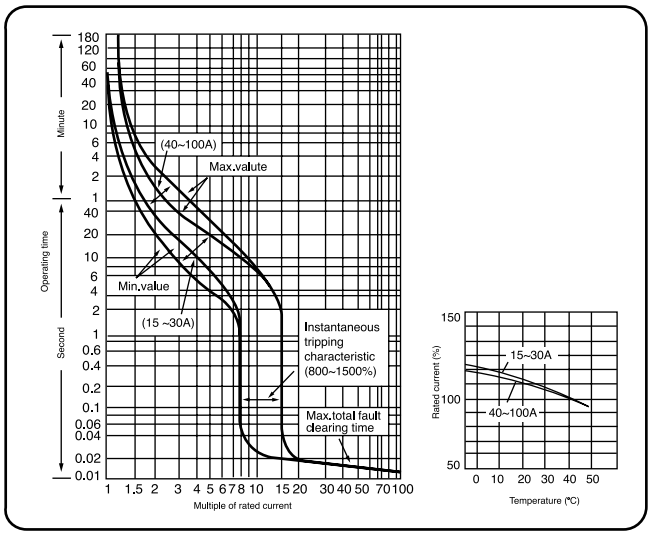
ABE52a, ABE53a
ABE62a, ABE63a
ABS32a, ABS33a



ABE102a, ABE103a
ABS52a, ABS53a, ABS54a
ABS62a, ABS63a, ABS64a
ABH32a, ABH33a



ABH52a, ABH53a, ABH54a
ABH102a, ABH103a, ABH104a
ABS102a, ABS103a, ABS104a



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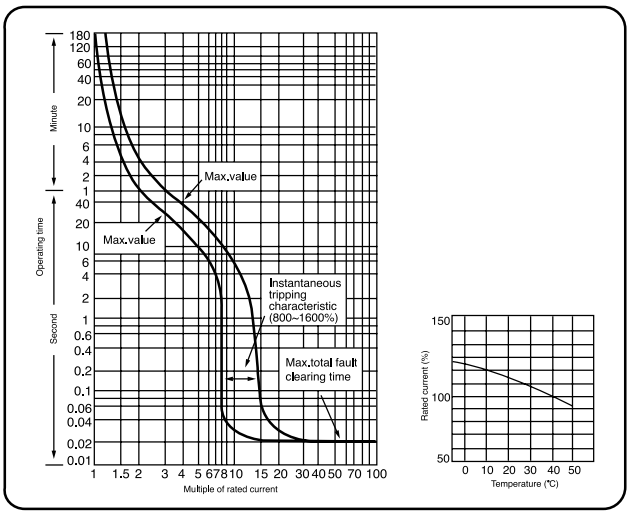
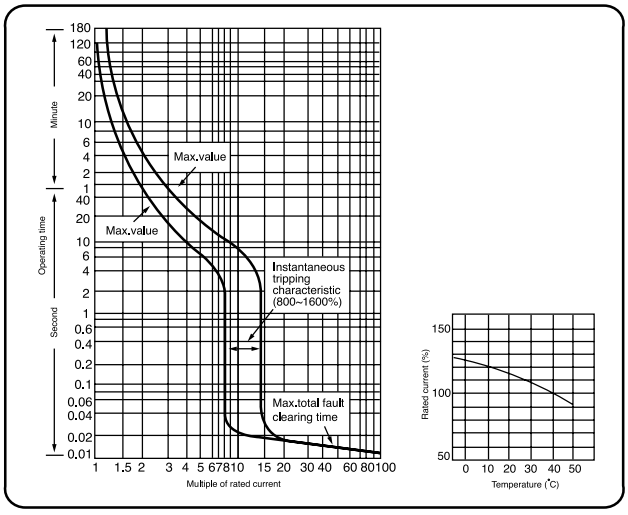
■Characteristic curve, Ambient Compensation curve

ABE202a, ABE203a
ABS202a, ABS203a, ABS204a

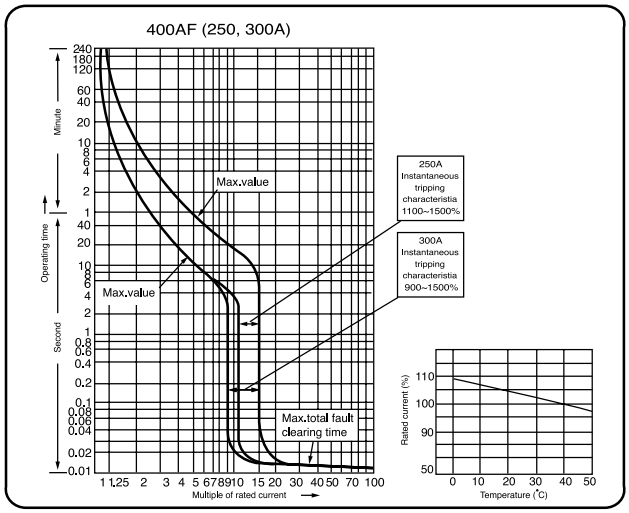


ABH202a, ABH203a, ABH204a
ABL202a, ABL203a, ABL204a



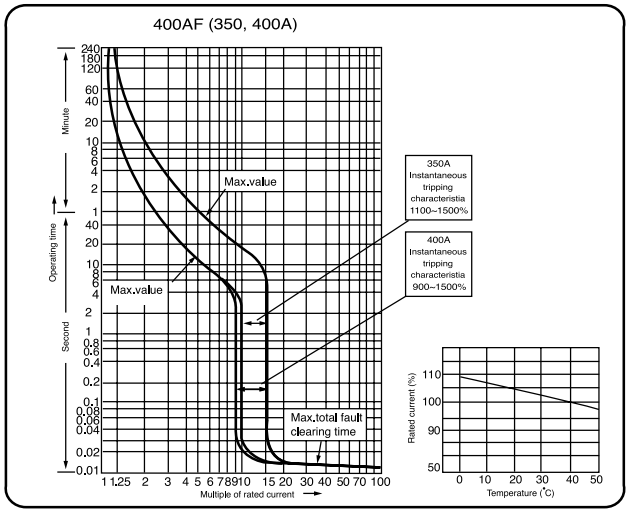
ABE402a, ABE403a
ABS402a, ABS403a, ABS404a

250, 300A



ABH402a, ABH403a, ABH404a
ABL402a, ABL403a, ABL404a

350, 400A



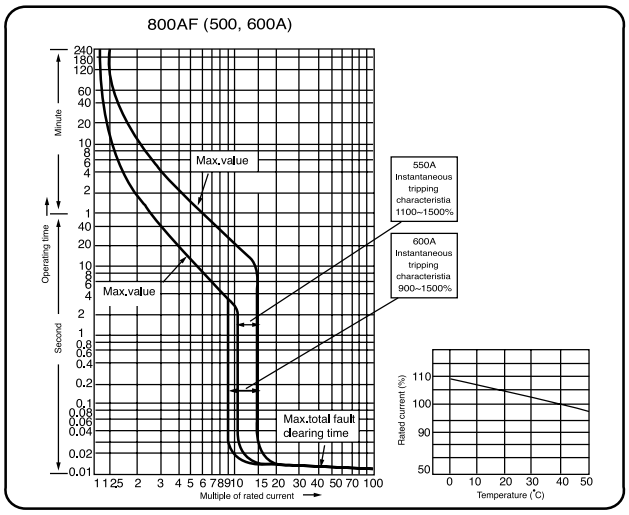
Techanical data

■Characteristic curve, Ambient Compensation curve

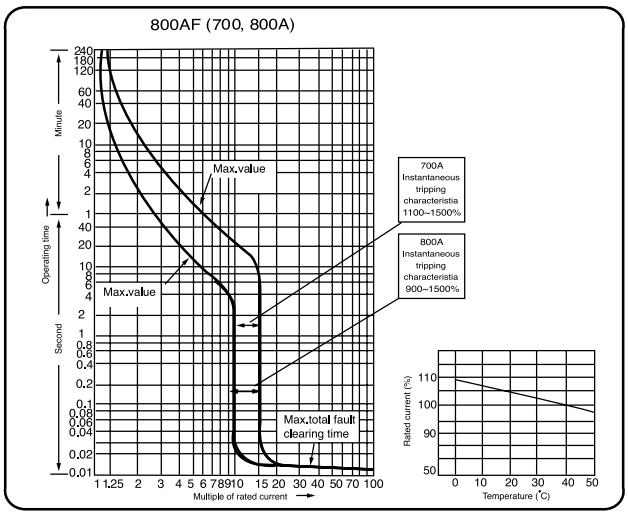
ABE802a, ABE803a, ABE804a
ABS802a, ABS803a, ABS804a

ABL802a, ABL803a, ABL804a

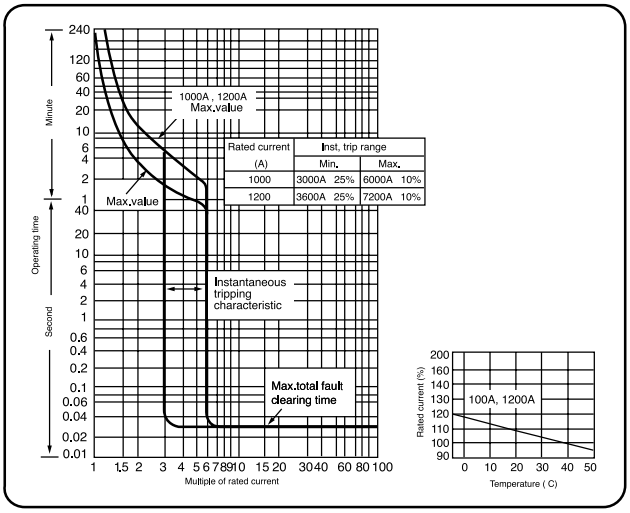
500, 600A



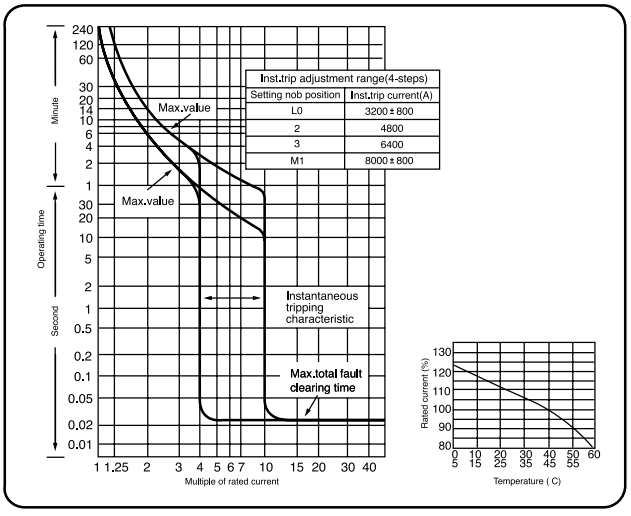
700, 800A



ABS1003, ABS1004
ABS1203, ABS1204



ABL1003, ABL1004
ABL1203, ABL1204



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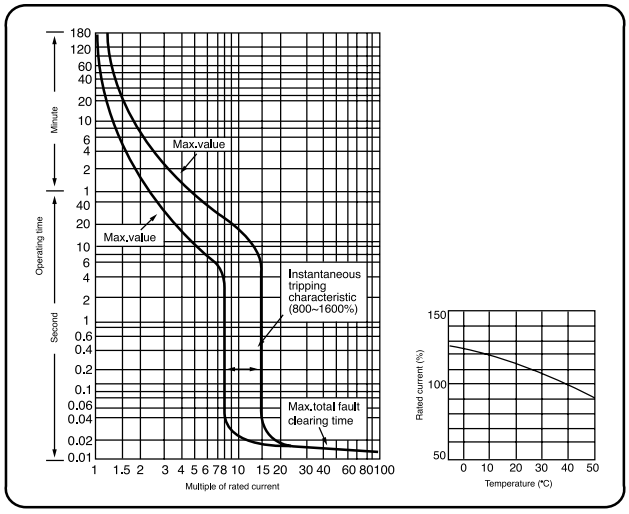
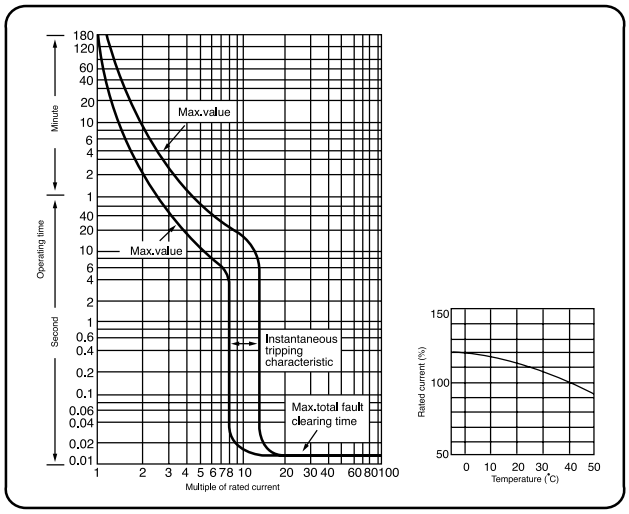
■Characteristic curve, Ambient Compensation curve

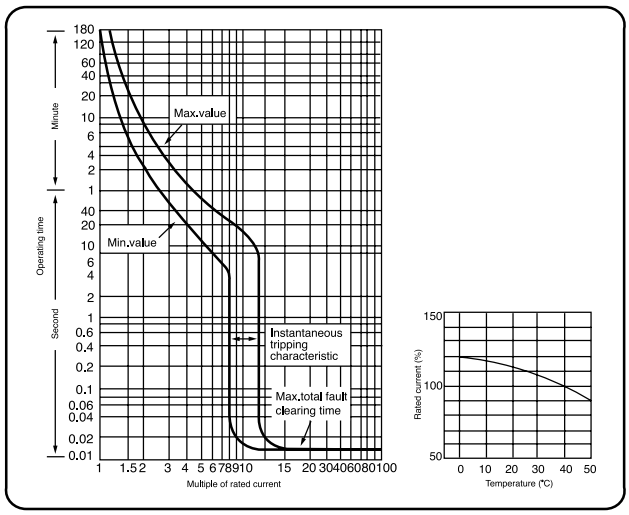
ABE402, ABE403
ABS402, ABS403, ABS404



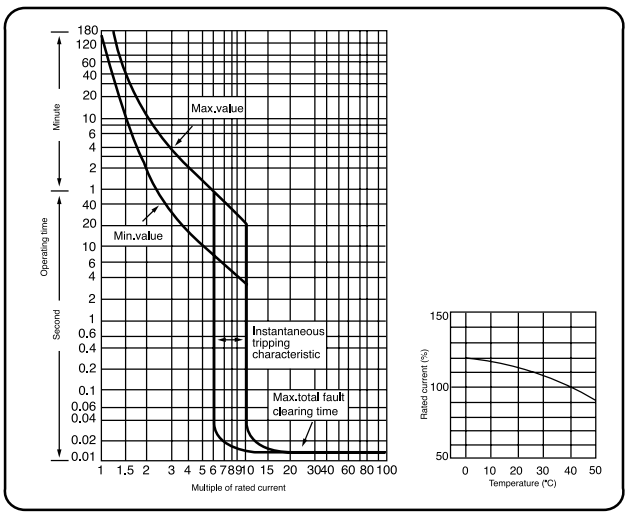
ABH402, ABH403, ABH404
ABL402, ABL403, ABL404



ABE602, ABE603, ABE604
ABS602, ABS603, ABS604
ABL603, ABL604



ABE802, ABE803
ABS803, ABS804
ABL803, ABL804



Earth leakage circuit breaker

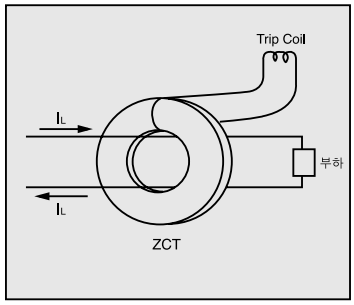
■Description

Earth leakage circuit breaker is designed to provide circuit protection with detecting the earth leakage. And the size of ELCB is compatible with MCCB in the same rating, so that it is capable of compact and modular construction

■Structure & Features

● Derating leakage and trip unit

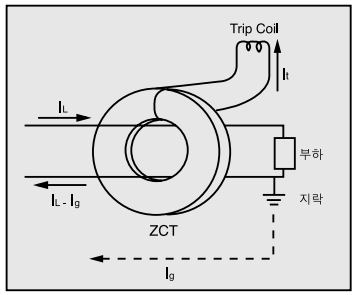
Earth leakage circuit breaker has the function of detecting the ground fault current caused by the earth leakage so that it can break the current under the abnormal situation. The leakage detector is equipped with a high-performed ZCT(zero current transformer).



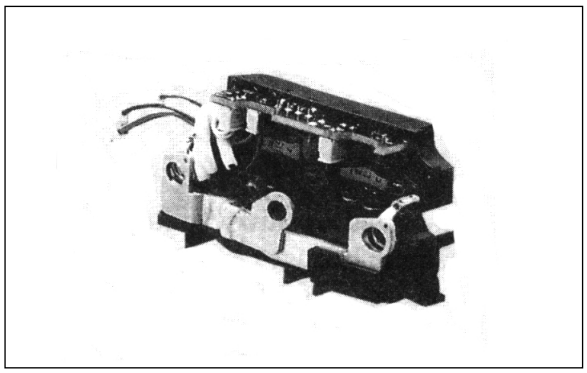
In Normal situation

● Small, high-effciency trip unit

A small, highly efficient trip coil has the compact feature and stable characteristics of detecting.

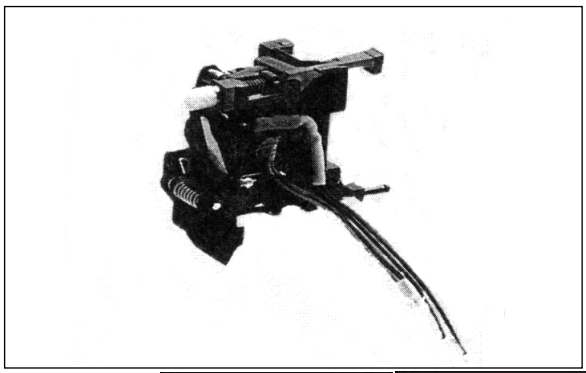


In Abnormal siuation



● Leakage Indicating Button

A trip button is protruded when tripped by earth leakage, so that it comes to be easy to differentiate from tripping caused by overcurrent.



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● Compatiblity of ELCB and MCCB
-Easy interchangeable

In the same ampere frames there are Earth leakage circuit breaker having the same size with MCCB, so that it s very useful to construct the standard modular panel. (30 to 800 AF)

● Selective voltage range

Earth leakage circuit breaker can be used with selecting the various operating voltage ranges under various circumstances.

Rated voltage	voltage range allowable
220V	176 to 242V
110/220V	88 to 242V
220/460V	176 to 510V

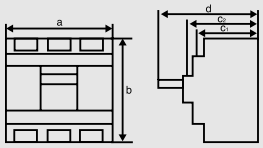
● Three-step selection of sensitivity to fault currents
-100/200/500mA

A three-step change (100/200/500mA) in the rated sensitivity to fault currents has widened the range of appliciation. Therefore, Earth leakage circuit breaker allows to select the proper sensitivity according to the change of specifications.

● Wide combination with internal accessories
-The same with MCCB

It s allowed to combine with the internal accessories like MCCB. Up to two auxiliary switches, two alarm switches and one shunt trip, one undervoltage trip is available to mount. For detail information, consult the accessories.

Earth leakage circuit breaker

Ampere frame			**30A**			
Tyep			S-Type EBS33	H-Type EBH33	E-Type EBE53	S-Type EBS53
Phase and wire			ψ2W,1 ψ3W, 3ψ3W		1ψ2W,ψ3W, 3ψ3W	
Number of poles			3	3	3	3
Rated operational voltage (V) 50/60Hz		Ue	220/460	220/460	220/460	220/460
Rated sensitive currnet (mA)			30 100/200/500	30 100/200/500	30 100/200/500	30 100/200/500
Tripping time (within sec.)			0.1	0.1	0.1	0.1
Rated current at 40℃ (A)		In	5 10 15 20 30	5 10 15 20 30	5 10 15 20 30 40 50	5 10 15 20 30 40 50
Rated ultimate	AC voltage	415V	5	10	5	10
Breaking capacity		380V	5	10	5	14
Icu (kA) (sym)		240V	10	25	10	25
(According to IEC 947-2)		220V	10	25	10	25
Tripping device	Thermal magnetic trip					
	Hydraulic magnetic trip		○	○	○	○
Current setting			Fixed	Fixed	Fixed	Fixed
Earth leakage tripping device			Solid-state	Solid-state	Solid-state	Solid-state
Earth leakage indication contact			○	○	○	○
Connection	Front mounting		○	○	○	○
	IEC rail mounting		-	-	-	-
Dimension (mm) 		a	75	75	75	75
		b	130	130	130	130
		c_1	60	60	60	60
		c_2	64	64	64	64
		d	80	80	80	80
	Weight (Kg)		0.75	0.75	0.75	0.9
Accessories	Auxiliary switch	AL	○	○	○	○
	Alarm switch	AX	○	○	○	○
	Shunt trip	SHT	-	-	-	-
	Undervoltage trip	UVT	-	-	-	-
	Rotary handle N-Type		N-30	N-30	N-30	N-30
	Terminal cover		○	○	○	○
	Insulation barrier		○	○	○	○

*For more information about accessories, look up to Molded case circuit breaker. (page 28)

Rated operating voltage

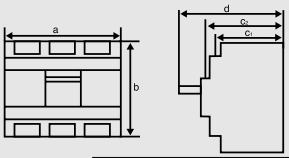
Rated voltage	Voltage range available
220V	176 to 242V
110/220V	88 to 242V
220/460V	176 to 510V

50A		60A		100A			
H-Type	L-Type	E-Type	S-Type	E-Type	S-Type	H-Type	L-Type
EBH53	EBL53	EBE63	EBS63	EBE103	EBS103	EBH103	EBL103
1φ2W, 1φ3W, 3φ3W		1φ2W, 1φ3W, 3φ3W		1φ2W, 1φ3W, 3φW			
3	3	3	3	3	3	3	3
220/460	220/460	220/460	220/460	220/460	220/460	220/460	220/460
30	30	30	30	30	30	30	30
100/200/500	100/200/500	100/200/500	100/200/500	100/200/500	100/200/500	100/200/500	100/200/500
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
40	40	60	60	60	60	60	60
50	50			75	75	75	75
				100	100	100	100
14	65	5	10	10	14	18	65
14	65	5	14	10	14	18	65
25	100	10	25	25	25	30	100
25	100	10	25	25	25	30	100
○	○				○	○	○
		○	○	○			
Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Solid-state	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state
○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○
-	-	-	-	-	-	-	-
90	105	75	75	75	90	90	105
155	165	130	130	130	155	155	165
60	82	60	60	60	60	60	82
64	86	64	64	64	64	64	86
82	109	80	80	80	82	82	109
1.5	2.1	0.75	0.9	0.9	1.5	1.5	2.1
○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
N-40	N-60	N-60	N-30	N-30	N-40		N-60
○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○

Rated operating voltage

Rated voltage	Voltage range available
220V	176 to 242V
110/220V	88 to 242V
220/460V	176 to 510V

Earth leakage circuit breaker

Ampere frame			**225A**		
Tyep			E-Type EBE203	S-Type EBS203	H-Type EBH203
Phase and wire			1ψ2W,1ψ3W, 3ψ3W		
Number of poles			3	3	3
Rated operational voltage (V) 50/60Hz		Ue	220/460	220/460	220/460
Rated sensitive currnet (mA)			30 100/200/500	30 100/200/500	30 100/200/500
Tripping time (within sec.)			0.1	0.1	0.1
Rated current at 40℃ (A)		In	125 150 175 200 225	125 150 175 200 225	125 150 175 200 225
Rated ultimate	AC voltage	415V	10	14	42
Breaking capacity		380V	10	14	42
Icu (kA) (sym)		240V	18	25	85
(According to IEC 947-2)		220V	18	25	85
Tripping device	Thermal magnetic trip		○	○	○
	Hydraulic magnetic trip				
Current setting			Fixed	Fixed	Fixed
Earth leakage tripping device			Solid-state	Solid-state	Solid-state
Earth leakage indication contact			○	○	○
Connection	Front mounting		○	○	○
	IEC rail mounting		-	-	-
Dimension (mm) 		a	105	105	105
		b	165	165	165
		c_1	60	60	99
		c_2	64	64	103
		d	84	84	127
	Weight (Kg)		1.7	1.7	2.7
Accessories	Auxiliary switch	AL	○	○	○
	Alarm switch	AX	○	○	○
	Shunt trip	SHT	-	-	-
	Undervoltage trip	UVT	-	-	-
	Rotary handle N-Type		N-50		N-60
	Terminal cover		○	○	○
	Insulation barrier		○	○	○

*For more information about accessories, look up to Molded case circuit breaker. (page 28)

Rated operating voltage

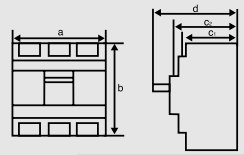
Rated voltage	Voltage range available
220V	176 to 242V
110/220V	88 to 242V
220/460V	176 to 510V

	400A		800A	
L-Type EBL203	S-Type EBS403	H-Type EBH403	S-Type EBS803	H-Type EBH803
	1ψ2W, 1ψ3W, 3ψ3W		1ψ2W, 1ψ3W, 3ψ3W	
3	3	3	3	3
220/460	220/460	220/460	220/460	220/460
30 100/200/500	30 100/200/500	30 100/200/500	30 100/200/500	30 100/200/500
0.1	0.03 to 0.1	0.03 to 0.1	0.03 to 0.1	0.03 to 0.1
125 150 175 200 225	250 300 350 400	250 300 350 400	500 600 700 800	500 600 700 800
65	35	50	35	50
65	35	50	35	50
125	50	85	50	100
125	50	85	50	100
○	○	○	○	○
Fixed	Fixed	Fixed	Fixed	Fixed
Solid-state	Solid-state	Solid-state	Solid-state	Solid-state
○	○	○	○	○
○	○	○	○	○
-	-	-	-	-
105	140	140	210	210
165	257	257	275	275
99	95	95	107	107
103	109	109	109	109
127	149	149	149	149
2.7	-	-	-	-
○	○	○	○	○
○	○	○	○	○
-	-	-	-	-
-	-	-	-	-
	N-70		N-80	
○	-	-	-	-
○	○	○	○	○

Rated operating voltage

Rated voltage	Voltage range available
220V	176 to 242V
110/220V	88 to 242V
220/460V	176 to 510V

Earth leakage circuit breaker

Ampere frame				400A	600A	800A	1000A	1200A
Tyep				S-Type 403 SGR	S-Type 603 SGR	S-Type 803 SGR	S-Type 1003 SGR	S-Type 1203 SGR
Phase and wire				1ψ2W, 1ψ3W, 3ψ3W				
Number of poles				3	3	3	3	3
Rated operational voltage (V) 50/60Hz			Ue	220/460	220/460	220/460	220/460	220/460
Rated sensitive currnet (mA)				30 100/200/500	30 100/200/500	30 100/200/500	30 100/200/500	30 100/200/500
Tripping time (within sec.)				0.1	0.1	0.1	0.1	0.1
Rated current at 40℃ (A)			In	250 300 350 400	500 600	700 800	1000	1200
Rated ultimate	AC voltage		415V	25	42	42	85	85
Breaking capacity			380V	25	42	42	85	85
Icu (kA) (sym)			240V	42	85	85	125	125
(According to IEC 947-2)			220V	42	85	85	125	125
Tripping device	Thermal magnetic trip			○	○	○	○	○
	Hydraulic magnetic trip							
Current setting				Fixed	Fixed	Fixed	Fixed	Fixed
Earth leakage tripping device				Solid-state	Solid-state	Solid-state	Solid-state	Solid-state
Earth leakage indication contact				○	○	○	○	○
Connection	Front mounting			○	○	○	○	○
	IEC rail mounting			-	-	-	-	
Dimension (mm) 			a	140	210	210	210	210
			b	350	390	390	620	620
			c_1	-	-	-	-	-
			c_2	103	103	103	150	150
			d	134	149	149	200	200
	Weight (Kg)			8.5	14.5	15.5	35.6	35.6
Accessories	Auxiliary switch		AL	○	○	○	○	○
	Alarm switch		AX	○	○	○	○	○
	Shunt trip		SHT	-	-	-	-	-
	Undervoltage trip		UVT	-	-	-	-	-
	Rotary handle	N-Type		-	-	-	-	-
	Terminal cover			-	-	-	-	-
	Insulation barrier			○	○	○	-	-

Rated operating voltage

Rated voltage	Voltage range available
220V	176 to 242V
110/220V	88 to 242V
220/460V	176 to 510V

Circuit breaker for household and similar installations

■Molded case circuit breaker

●F-Series

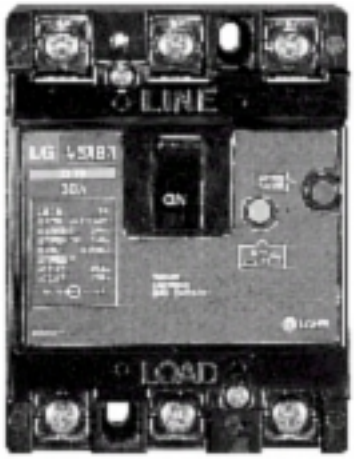
ABE-□F is molded case circuit breaker designed to mount onto especially household and similar installations .

- 30 AF to 100 AF
- Rated voltage 460V
- Rrotecting against overload, short-circuit
- 2, 3 poles
- 35mm rail Mounting
- Front connection

■Earth leakage circuit breaker

●FR-Series

□FR is earth leakage circuit breaker designed to mount onto espectially household and similar installations .

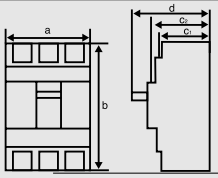


- 30 AF to 100 AF
- Rated voltage 100/220V
- Detecting earth leakage
  Protecting against overload,
  ground fault, as well as short-circuit
- 2, 3 poles
- 35mm rail Mounting

■Features

- Compativility in size between MCCB and ELCB

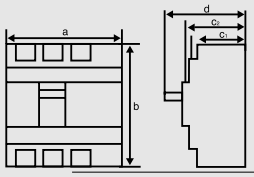
Molded case circuit breaker
For
household and similar installations

Ampere frame			30A		50A		100A	
Tyep			ABE32F	ABE33F	ABE52F	ABE53F	ABE102F	ABE103F
Number of poles			2	3	2	3	2	3
Rated maximum operational voltage (V)		Ue	460	460	460	460	460	220
Rated current at 40℃ (A)		In	3	3	15	15	60	60
			5	5	20	20	75	75
			10	10	30	30	100	100
			15	15	40	40		
			20	20	50	50		
			30	30				
Rated ultimate breaking capacity	AC voltage	415V	1.5	1.5	1.5	1.5	1.5	
Icu (kA) (sym)		380V	1.5	1.5	1.5	1.5	1.5	1.5
(According to IEC 947-2)		240V	2.5	2.5	2.5	2.5	5	5
Rated service-circuit breaking capacity	Ics (=%Icu)		50	50	50	50	50	50
Tripping device	Thermal magnetic trip							
	Hydraulic magnetic trip		○	○	○	○	○	○
	Magnetic-only trip							
Trip test button			-	○	-	△(1)	-	△(1)
Current setting			Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Connection	mounting with terminal screw		○	○	○	○	○	△(2)
	IEC rail mounting		○	○	○	○	○	○
Dimension (mm) 		a	50	75	50	75	75	75
		b	96	96	96	96	96	96
		c_1	-	-	-	-	-	-
		c_2	60	60	60	60	60	60
		d	80	80	80	80	80	80
	Weight (Kg)		0.3	0.42	0.3	0.42	0.47	0.5
Accessories	Auxiliary switch	AL	-	-	-	-	-	-
	Alarm switch	AX	-	-	-	-	-	-
	Shunt trip	SHT	-	-	-	-	-	-
	Undervoltage trip	UVT	-	-	-	-	-	-
	Rotary handle N-Type		-	-	-	-	-	-
	Terminal cover		○	○	○	○	○	○
	Insulation barrier		-	-	-	-	-	-

(1) It s available only if additional order.
(2) It requires to use separate mounting holder if mounted with the terminal screw.

Contents Index

Molded case circuit breaker
For
household and similar installations

Ampere frame			30A		50A		100A	
Tyep			32FR	33FR	52FR	53FR	102FR	103FR
Number of poles			2	3	2	3	2	3
Rated operational voltage (V)	50/60Hz	Ue	110/220	110/220	110/220	110/220	220	220
Rated sensitive currnet (mA)			30	30	30	30	30, 100	30, 100
Tripping time (within sec.)			0.03	0.03	0.03	0.03	0.03, 0.1	0.03, 0.1
Rated current at 40℃ (A)		In	5 10 15 20 30	5 10 15 20 30	15 20 30 40 50	15 20 30 40 50	60 75 100	60 75 100
Rated ultimate	AC voltage							
Icu (kA) (sym)		220V	3	3	3	3	5	5
(According to IEC 947-2)		110V	3	3	3	3	5	5
Tripping device	Thermal magnetic trip							
	Hydraulic magnetic trip		○	○	○	○	○	○
Current setting			Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Earth leakate tripping device			Solid-state	Solid-state	Solid-state	Solid-state	Solid-state	Solid-state
Earth leakate indication contact			-	○	-	○	○	○
Protection	Earth leakage		○	○	○	○	○	○
	Overcurrent		○	○	○	○	○	○
	Short-circuit		○	○	○	○	○	△(1)
Connection	mounting with terminal screw		○	○	○	○	○	○
	IEC rail mounting		○	○	○	○	○	○
Dimension (mm)		a	50	75	50	75	75	75
		b	96	96	96	96	96	96
		c_1	-	-	-	-	-	-
		c_2	60	60	60	60	60	60
		d	80	80	80	80	80	80
	Weight (Kg)		0.4	0.5	0.4	0.5	0.5	0.6
Accessories	Auxiliary switch	AL	-	-	-	-	-	-
	Alarm switch	AX	-	-	-	-	-	-
	Shunt trip	SHT	-	-	-	-	-	-
	Undervoltage trip	UVT	-	-	-	-	-	-
	Rotary handle N-Type		-	-	-	-	-	-
	Terminal cover		○	○	○	○	○	○
	Insulation barrier		-	-	-	-	-	-

(1) It requires to use separate mounting holder if mounted with the terminal screw.

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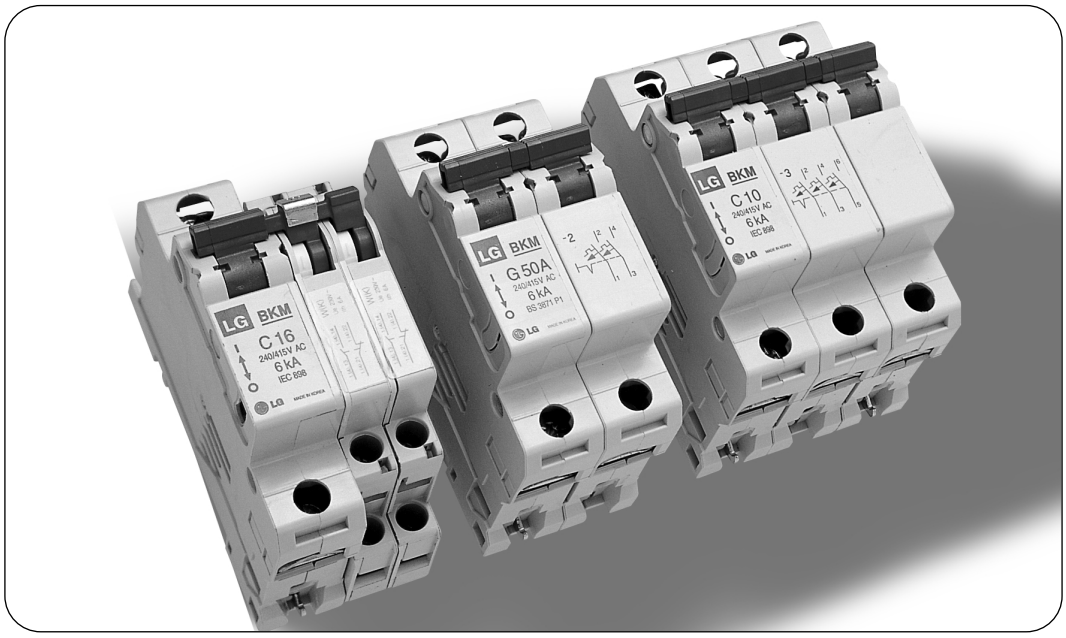
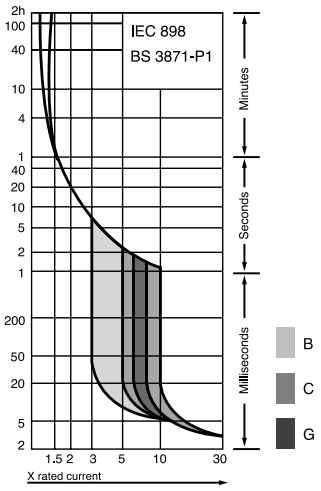
Miniature circuit breaker - BK-Series



- 1, 2, 3, 4 Poles & Isolator
- 35mm Din rain Mounting
- Trip Free Mechanism
- Accessories
  5 Auxiliary Switch & Alarm Switch
- Rated voltage 230 / 400 Vac
- CE Marking according to IEC898
- Characteristics
  B & C according to IEC898

■ Characteristics of time-current curves



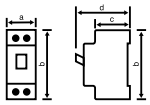
■ Technical data

Standard		IEC 898, EN 60898
Tripping method		Thermal-coil magnetic
Terminal capacity		Flexible(1.75~16㎟), Solid(0.75~25㎟)
Life cycle		20,000(mechanical) / 20,000(electrical : rated current)
Mechanical resistance		20g (for 20ms)
Degree of protection		IP20
Rated frequency		50/60Hz
Ambient temperature		Open (-25℃ to 50 ℃), Enclosed (-25℃ to 40 ℃)
DC	operation voltage	60V(1pole), 120V(2pole)
apply	Breaking capacity	1.5kA(for 4ms)
Mounting		Din-rail type

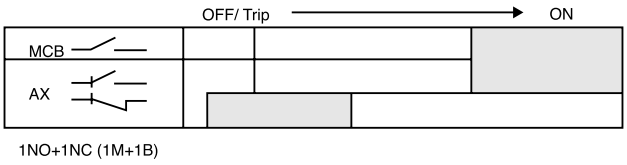
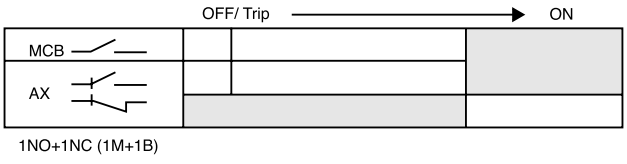
Contents Index

■Technical data

●Specification

Series		BKM									
Type		B			C				G		
Poles		1	2	3	1	2	3	4	1	2	3
Rated Voltage (V)		240/415									
Rated Current (A)		6, 10, 16, 20, 25			2, 4, 6, 10, 20, 25, 32, 40, 50				6, 10, 15, 20, 30, 40, 50		
Breaking Capacity (kA)		10			6				6		
Tripping Device		Thermal-coil magnetic									
Dimensions (mm)	a	17.7	35.4	53.1	17.7	35.4	53.7	0.8	17.7	35.4	53.1
	b	80									
	c	43									
	d	67									
Weight (kg)		0.1	0.2	0.3	0.1	0.2	0.3	0.4	0.1	0.2	0.3

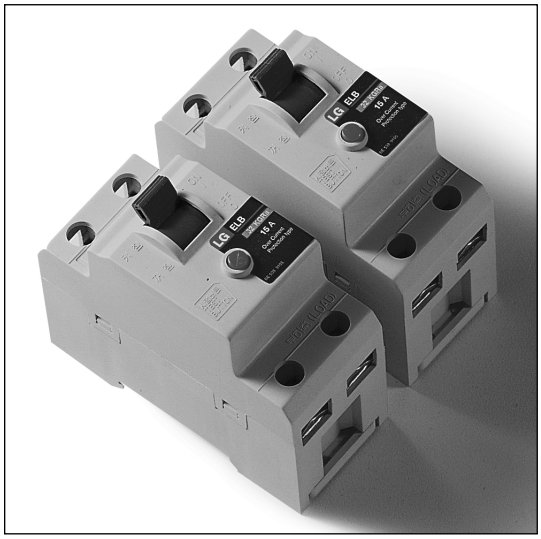
●Auxiliary Switch & Alarm Switch

Rated operational current		220V 3.5A
(AC11 duty)		415V 2A
Mechanical lifespan		2,000 operations
Terminal capacity		0.75...2.5 ㎟
Weight		0.04kg / EA
Sequence diagram	Auxiliary switch, AX	 1NO+1NC (1M+1B)
	Alarm switch, AL	 1NO+1NC (1M+1B)

Earth leakage circuit breaker - 32KGRa

■Description - 32KGRa

In the event of an earth leakage fault gaeater than or equal to 30mA occuring, the circuit breaker 32KGRa will trip automatically not later than 30ms.



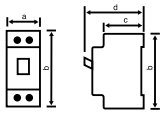
■Features

- Small size, Light weight
- Compatible with Miniature circuit breaker, BK□-Series
- 35mm Din rail mounting
- Trip free handle mechanism
- Test button-Simulation of 30mA earth fault

■Functions

- Protection against overcurrents
- Protections of people against direct or indirect contact to live parts
- Protection of propery against the risk due to faulty insulation

■Technical data

Frame current			**30A**
Color			White
Rated voltage			110/220V
Frequency			50/60Hz common use
Phase & Wires			1ψ2W(2pole)
Rated current			5A, 20A, 30A
Over current Protection	Operating time		According to Characteristics of time-current cueves
	Tripping device		Thermal magnetic
	Breaking capacity		1.5kA
Earth leakage Protection	Sensitivity		15mA, 30mA
	Non-tripping current		7.5mA, 15mA
	Trippint time at sensitivity		≤ 30ms
	Tripping device		Solid-state
Connection			IEC rail mounting
Dimension (mm) 		a	35
		b	80
		c	43
		d	75.7
Weight (kg)			0.13kg

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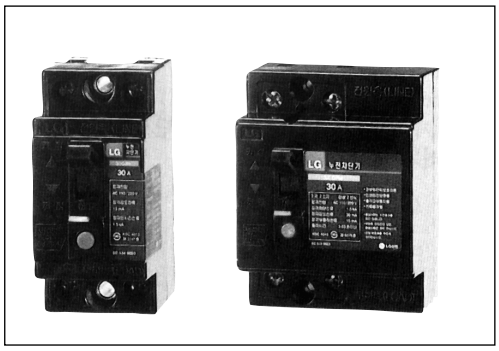
Earth leakage circuit breaker - GR-Series

■Description

In the event of an earth leakage fault gaeater than or equal to 15 or 30mA occuring, the circuit breakers will be tripped automatically not later than 30ms.



Protection :

-Portection against overcurrents
-Portection of people against direct or indirect contact to live parts
-Portection of property against the risk due to faulty insulation

Functioning :

-The test button enables the simulation of a 15 or 30mA insulation fault.
-Trip free handle mechanism

Installation :

-Screw mounting

ISO9001 Certificate by TUV Rheinland

■Technical data

Frame current rating		30AF
Rated voltage and frequency		100/220V, 50/60Hz common use
Phase & wires		1ψ2W (2pole)
Overcurrent protection		
	rated current	15A, 20A, 30A
	tripping time	see characteristic curve
	tripping device	thermal
	breaking capacity	1.5kA
Earthleakage protection		
	sensitivity (pick up currents)	
	non-tripping current	
	tripping time at sensitivity	≤ 30ms
	tripping device	solid state

Type		**32GRa**	**32GRh**
Dimension (mm)	a	62	33
	b	82	70
	c	42	42
	d	56.7	56.7
Weight (kg)		0.21kg	0.1kg

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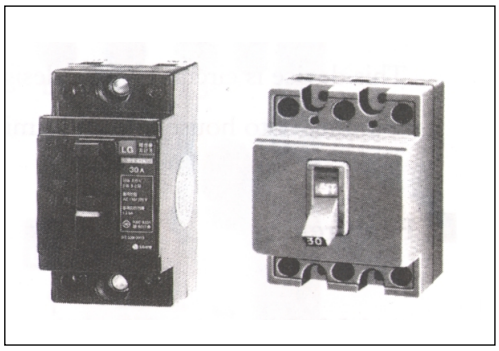
Miniature circuit breaker - BS-Series

■ Description - BS-Series

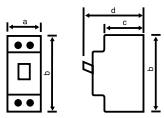
This device is circuit breaker designed for mounting onto household and similar installations. It s also permitted to protect the circuit of vending machine, show case, water purifier.



■ Features

- Small size, Light weight
- Terminal block mounting & Self-up screw mounting
- Trip free handle mechanism

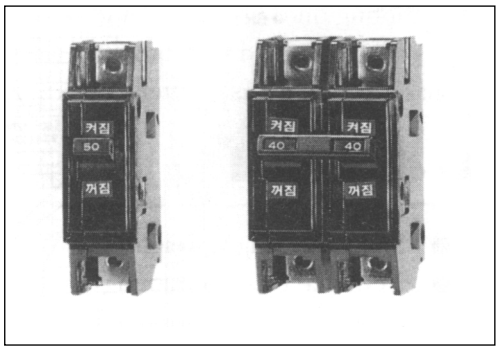
■ Technical data

aType		BS-31a	BS-32a
Poles & Elements		2P1E	2P2E
Rated current		6, 10, 15, 20, 30	
Ratted voltage		110/220V AC	
Frequency		50/60Hz common use	
Breaking capacity (kA)		1.5	
Trip device		Terminal block mounting	
Connection		Terminal block mounting	
Dimension (mm) 	a	33	33
	b	70	70
	c	42	42
	d	56.7	56.7
Weight (kg)		0.1	0.1

Miniature circuit breaker - BF-□a Series

■Description - BF-□a Series

This device is circuit breaker designed for mounting onto household and similar installations.

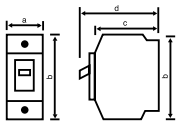


■Features

- 1, 2, 3 Poles
- Rated voltage 220 Vac
- Holder & Bracket Mounting with screw
- Trip Free Mechanism

■Technical data

- Specification

Type			BF					
			BF-52a	BF-52a	BF-53a	BF-101a	BF-102a	BF-103a
Number of poles			1	2	3	1	2	3
Color			Black			Black		
Ampere Frame			10, 15, 20, 30, 40, 50			60, 75, 100		
Rated operational voltage			220V			220V		
Breaking capacity (kA)	AC voltage	415V	2.5			2.5		
Icu		240V	10			10		
	DC voltage	125V	1			1		
Tripping			Thermal magnetic			Thermal magnetic		
Dimensions (mm) 		a	25	50	76.5	25	50	76.5
		b	97	97	97	97	97	97
		c	60	60	60	60	60	60
		d	77	77	77	77	77	77
Weight (kg)			0.11	0.23	0.35	0.11	0.23	0.35

LG constantly endeavors to improve our products, so that information in this catalog is subject to change without notice.

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